

CHAPTER NEWS ISSUE

The BIOLOGIST

Founded May 1916

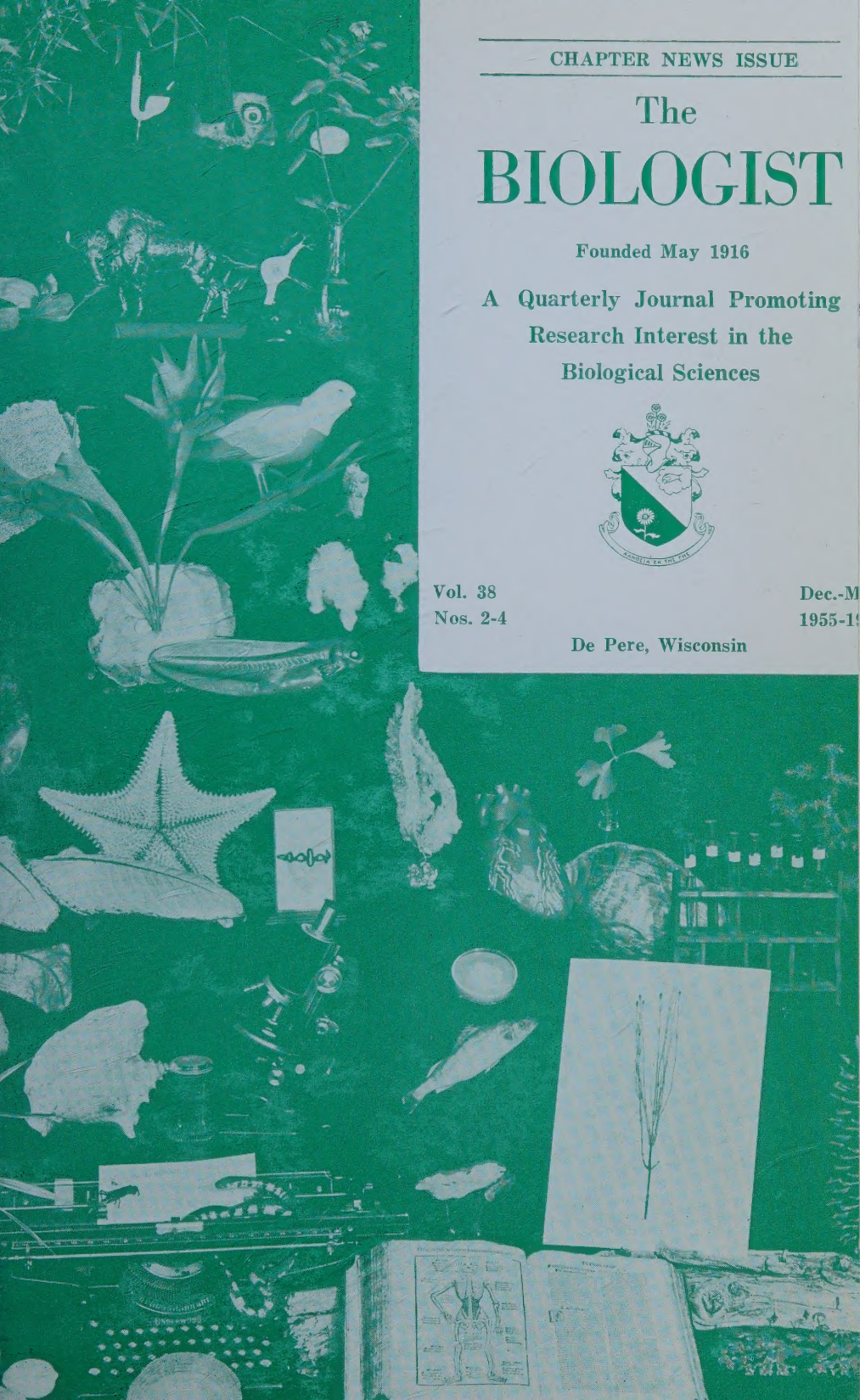
A Quarterly Journal Promoting
Research Interest in the
Biological Sciences



Vol. 38
Nos. 2-4

Dec.-M
1955-1956

De Pere, Wisconsin



Our Cover Melange

Is strictly an editorial brainstorm, aided and abetted by our campus photographer, Mr. Gus Aschert.

Top specimen on the biological totem pole is paleontological, an early Amerind. A sardonic touch of life is added by the glass eye, and the superimposed doctoral cap. (This is believed to be the first authenticated photograph of a doctor's cap adorning an empty skull!) *Homo Americanus* is flanked on the viewer's right by an item from the embryology stockroom, and on the left by a fermentation tube filled with milk. This latter appears in deference first to the economic importance of the dairy interests, as well as to the dry states of mind in the U.S.A. Both exhibits, we are told, are very symbolic, at the human level. Overshadowing this level on the left is a dwarf bamboo, *Pleoblastus distichus* (Nakai).

The second level is dominated by an onxy-bottomed statuette of *Bison Americanus*, L. which turns its tail to an atomical model of a nerve cell, and a flask containing the Madagascar periwinkle, *Vinca rosea*, L. Some of our friends argue that the bronze bison, male, is most significant, either for its brassiness, or for other qualities, which typify the editorial policy of this magazine. (It was pure accident that the top branches of the cactus, *Opuntia brasiliensis* (Haw.) practically tickle the bull's nose.) The third level carries three specimens of marine life, — a sea fan, *Gorgonia flabellum*, L. on the left, a basket sponge, *Hyalonema longissima* (Ver.), on the right, and between them a model sea gull, species ornithologically undetermined.

Another marine form appears on the fourth level, — a jaded but definitely pickled lobster, *Homarus Americanus*, (M-Ed.). Overshadowing it and much of the next higher level, is a representative of the Australian biota, a stag-horn fern, *Platyserium hillii*, (Moore). Next to it is an embryological model of a young tadpole, above which nod bolls of cotton, *Gossypium hirsutum*, L.

The fifth level starts out with the chlorophyll-deficient leaves of *Dieffenbachia picta* (Schott), next to which is what we think is *Dermasterias imbricata* (Grube), the leather starfish of our northwestern coasts. Here, too, is a laboratory model of karyokinetic metaphase, to the reader's right of which is the Devil's apron of M.B.L. days, *Laminaria Aghardii* (Kjell.). A model mammalian heart from the anatomy laboratory is next in line. Following it to the right is an unhusked seed from *Cocos nucifera*, L., the versatile coconut. Above it flaunt the leaves of the Chinese maidenhair-tree, *Ginkgo biloba*, L. The test tube rack contains solutions demonstrating the pH of various standard fertilizers. Behind them spread the branches of another South Pacific representative, the Norfolk Island pine, *Araucaria excelsa*, R.Br. Underneath it nestles rather incongruously a model of the eight-cell

stage from an embryological series.

The sixth level in this biological "Inferno" demonstrates first the shell of the giant conch, *Strombus gigas*, L., of our southern coasts, followed by a Stender jar with histological preparations in the process of becoming. The compound microscope with a slide on its stage follows appropriately enough. (If you have missed your favorite biological subject on this page, it is no doubt the specimen on the microscope.) To your right as you look at it, is a bacteriological plate with a rather healthy colony on it, beneath which a recently hooked perch, *Perca flavescens*, L., is being hauled out on an imaginary line.

The seventh, and last, level begins with the striped strap-like leaves of the variegated screwpine, *Pandanus Veitchii*, (Dall.), beneath which are some economically significant horticultural offerings, — the onion, *Allium cepa*, L.; the banana, *Musa paradisiaca*, var. *sapientum*, (Kind.); the potato, *Solanum tuberosa*, L.; and the lemon, *Citrus Limon*, (Burm.).

To the right of these on the bottom row is a shell of the giant sea scallop, *Pecten magellanicus* (Gmelin). Continuing farther to the right we come upon a rare woodcut of the human skeleton, figured in the old Latin *Ortus Sanitatis*, the "Garden of Health," printed around 1505 A.D. This old book rests on an even older spruce log, one of those dug out of the Valders clay at Two Creeks, Wisconsin. The Carbon-14 investigators at the University of Chicago claim that the trees of this buried forest lived some 10,500 years ago. Beneath the log at the far right is a realistic model of some *Marchantia polymorpha*, L. thalli.

Above the venerable tree trunk is a more modern conifer specimen, the 12-inch cone of our Western red fir, *Abies magnifica* (Mun.) Moving back to the left of the cone we see a herbarium mount of a horsetail, *Equisetum palustre*, L. from Switzerland. Still farther left is a bracket-fungus not uncommon in our north woods, *Fistulina hepatica* (Fr.), the beef-steak fungus. To the left of this, and bulking largest in the corner is an ancient wide-carriage typewriter which rates pride of place in our melange as representing the various forms of scientific writing, including editorial work. Perched on the letterhead is a locust, *Dissosteira carolina*, L. Facing it across the paper and coiled in and out of the machine, is a Mississippi "horn" or "hoop" snake, *Farancia abacura* (Holbrook). It slithered its way into our collection in response to the request of our past president, Dr. A. I. Ortenburger, that the noblest of the biological sciences, Herpetology, not be left out of the picture. One of our most respected contributors, Dr. David Causey, of Arkansas, takes a characteristically different view. He claims that this is definite proof of something he has suspected all along, namely that the editorial typewriter of "THE BIOLOGIST" is manned by a snake!

"Created by Balfour"



**YOUR GUARANTEE OF
PLEASURE AND SATISFACTION**

Your gift from Balfour — in its attractive Blue Box — will be treasured always. Whether it is for a birthday gift, an initiation gift or a gay party favor, select from the wide variety shown in the 1956 BALFOUR BLUE-BOOK.

CHECK YOUR CHAPTER REQUIREMENTS

- ★ **Initiation Needs**—Badges (check your national regulations); place cards; stationery; invitations.
- ★ **Stainless Steel Flatware** die struck with your emblem. Write for quotations.
- ★ **Programs** for all occasions. Write for samples mentioning party theme.
- ★ **Ceramics and Dinnerware** add prestige to your Chapter House. Flyers sent on request.

L. G. BALFOUR CO. Attleboro, Mass.		Date
Please Send:		Samples:
☐ Blue Book		☐ Stationery
☐ Ceramic Flyer		☐ Invitations
☐ Knitwear Flyer		☐ Programs
☐ Badge Price List		☐ Place Cards
Name		
.....		
Phi Sigma		

Official Jeweler to Phi Sigma

L.G. Balfour COMPANY
ATTLEBORO, MASSACHUSETTS
In Canada . . . Contact your nearest BIRK'S STORE

THE BIOLOGIST

A Quarterly Journal Sponsored by the
Phi Sigma Biological Society

CONTENTS

OUR COVER MELANGE	81
GEORGE W. BEADLE, Retiring President of A.A.A.S.	84
THE ART OF FALLACY IN SCIENCE	85
By Dr. Norman D. Levine, Urbana, Ill.	
VISUAL ACUITY OF HAMSTERS	91
By Norma L. Skow, Lewisburg, Pa.	
PAUL B. SEARS, President of A.A.A.S.	93
CONSERVATION IN CANADA	94
NEW BOOKS BY OUR AUTHORS	98
LAURENCE H. SNYDER, President-Elect of A.A.A.S.	100
PHI SIGMA TODAY	101
By Dr. Karl F. Lagler, Ann Arbor, Mich.	
CHAPTERS, OFFICERS AND ACTIVITIES	102
OFFICERS OF PHI SIGMA, 1916-1956	104





(Photo by ENGSTEAD, Beverly Hills, Calif.)

Prof. George W. Beadle, Ph.D., D.Sc., is the Retiring President of The American Association for the Advancement of Science. B.S. in 1926, and M.S. in 1927 at Nebraska, he received his Ph.D. in 1931 at Cornell. He entered Xi Chapter of Phi Sigma in 1925.

THE BIOLOGIST

VOL. 38

DEC.-MAY 1955-56

Nos. 2-4

THE ART OF FALLACY IN SCIENCE

By Norman D. Levine, Ph.D.

Professor of Veterinary Parasitology

College of Veterinary Medicine and Agricultural Experiment Station

University of Illinois, Urbana, Ill.

It is often said that man is the only rational animal. This statement requires some slight modification. It should be, "Man *can* be a rational animal." Most of the time, though, he isn't. Our whole way of living and thinking is essentially irrational. We pick up ideas as children and carry them with us until we die. We never stop to examine them; we simply accept them. Many are false, and the human brain is permeated with error and superstition.

Rigorous, logical thinking is too difficult; fallacious thinking is easy. One might even say that fallacy is the commonest product of the human mind.

We have a superstition for every occasion. Tom Sawyer and Huck Finn used spunk water and a dead cat to cure warts. Some farmers used to think that if you wanted a heifer calf you should face the cow east when she is bred, and if you wanted a bull calf you should face her west—or perhaps it was the other way round. Lucky charms and rabbit feet ward off evil,

but walking under a ladder, breaking a mirror, or spilling the salt bring it on.

Almost every newspaper has an astrology column, and magazines devoted to the subject sell better than Harper's or the Atlantic Monthly. Numerology also has its addicts, and some of its ideas influence the lives of even the most skeptical. Why is the legal age for voting 21? Because it is the product of two magic numbers, 3 and 7. It has nothing to do with the age at which a person becomes capable of intelligent discrimination, which varies in different people between twelve and never.

Hepatoscopy and augury from the flight of eagles are out, but augury with cards or tea-leaves certainly isn't. And thousands of mediums advertise their ability to outdo Western Union by transmitting messages to and from the other world. . . . It is a noteworthy fact that none of the departed relatives of these mediums' customers seems to be suffering from the heat.

Even in science all our thinking is

not precise and clear. Logical thinking is a basic tool of science, and formal logic is a branch of applied mathematics, yet relatively few scientists have ever taken a course in it. We could all benefit from exposure to the subject; for those wishing to take the plunge, one book which I recommend for its clarity and readability, is Max Black's *Critical Thinking: An introduction to logic and scientific method*. (1)

This is not a dissertation on logic. All I want to do is fit some of our scientific errors into the classical catalog of logical fallacies. We all recognize the beasts, but it helps to name them.

Begging the Question

Begging the question is the process by which the conclusion of a line of reasoning is simply a restatement in different words of the premises. Another name for it is arguing in a circle.

Aristotle's argument for the finiteness of the universe is a good example of begging the question: An infinite body cannot have a center. The universe has a center—the center of the earth. Therefore, the universe is not infinite, but finite. And the opening sentence of his *Nichomachean Ethics* is a beautiful circular definition: "Every art and every inquiry, and similarly every action and pursuit, is thought to aim at some good; and for this reason the good has rightly been declared to be that at which all things aim."

Another example from antiquity was Galen's favorite remedy, Samian clay. He said of it, "All who drink this remedy recover in a short time, except those whom it does not help, who all die and have no relief from any other medicine. Therefore it is obvious that it fails only in incurable cases."

But we don't have to look to antiquity for examples. Here are some modern ones:

"The earth spins because of a ro-

tatory motion acting around its axis."

"Nembutal puts people to sleep because it is a soporific."

"A stream is polluted when it contains more organic matter and less oxygen than are to be found in the unpolluted portions of the flow of the stream."

"What is time?" "Time is duration." "What is duration?" "Duration is the continuance of time."

It is not at all unusual for medical men to beg the question in making diagnoses. Many diagnoses do nothing else. "Idiopathic anemia" is one; functional sterility" and "amaurosis" are others. A patient with a stomach ache has gastralgia. One with enlarged lymph glands has lymphadenitis. Or perhaps someone whom the modern equivalent of Samian clay has failed to help comes to autopsy, and the puzzled pathologist falls back on "irreversible cardiac stasis."

Of course this last diagnosis was not advanced seriously, but the others have little more value. The question implicit in diagnostic work is, "What caused this condition?" But in my examples, nothing is said about the cause. The condition itself is simply described in words of Greek or Latin derivation, often as polysyllabically as possible. The customer may be satisfied, but the practice is often merely a cloak for ignorance.

This is an amazingly common type of error. Too many otherwise capable people think that they have explained some phenomenon when they have merely named it. To this category belong Bergson's *elan vital* and Haacke's orthogenesis.

The Argument from Analogy

The argument from analogy is both attractive and helpful, but it can also be most dangerous and deceiving. It is the argument of the type: "We know that *a* causes *b*. We know also that *c* resembles *a*, and that *d* resembles *b*. Therefore *c* causes *d*."

Perhaps it does, but this is no proof.

All we have is a resemblance. *A* is not *c*, and *b* is not *d*, and there is therefore no necessary similarity in the relations between the two pairs. Nevertheless if employed intelligently this type of argument is very useful as an aid in explaining or illustrating ideas, or even in making new discoveries.

One useful example of the argument from analogy was Lillie's iron wire theory of the transmission of impulses along a nerve. Another was Ehrlich's lock and key explanation of agglutination and related phenomena. We use others daily in our teaching.

In the Middle Ages the argument from analogy was the basis of the medical Doctrine of Signatures. It was believed that every plant and animal bore a sign or signature which indicated how it could be used for the benefit of man. Walnut meats were good for brain trouble because they look like brains. Bear grease was good for baldness because bears are hairy. Plants with yellow flowers or yellow juice were good for jaundice. The saffrage gets its name, which means "stonebreaker," because it grows in cracks in rocks; it was used to break up kidney stones. Medieval herbals were actually compendia of plant descriptions, the uses of the plants being derived from their signatures.

Long ago the Chinese recognized the pitfalls of this type of argument. The Taoist philosopher, Liehtze, told how Confucius came one day upon two boys arguing. They told him that they were arguing whether the sun was closer to the earth in the morning or at noon. One boy said that it was closer in the morning, because it looks bigger then, and everyone knows that the closer a thing is, the bigger it looks. The other boy said that it was closer at noon, because it is hotter then, and everyone knows that the closer one is to a hot body, the hotter it feels. They thought Confucius stupid because he couldn't tell them which was right.

A modern example of the argument from analogy is the practice of draw-

ing conclusions about human nutrient requirements from experiments on rats. There is a real pitfall here, although I must admit that it has worked to the advantage of the manufacturers of pantothenic acid, which is included in almost every multiple vitamin capsule on the market, even though there is no evidence that man needs it.

LeComte du Nouy perpetrated another example in his popular book, *Human Destiny* (2). The first third of the book is a "proof" that life could not have arisen by chance. Du Nouy stated that if 1,000 white particles and 1,000 black particles are shaken up in a tube together, the chances that all the white particles will be at one end of the tube and all the black ones at the other are 1.489×10^{600} . This degree of dissymmetry is considered 1.0. If the particles are all mixed together so that a homogeneous gray impression is given the degree of dissymmetry is 0.5. The probability of the black and white particles falling into a pattern with a degree of dissymmetry of 0.9 is 2.02×10^{321} .

Arguing from this model, Du Nouy claimed that the chances of protein molecules with 2,000 atoms and a degree of dissymmetry of 0.9 being produced by pure chance were one in 2.02×10^{321} . This he dismissed as impossible from a practical standpoint.

But carbon, hydrogen, oxygen, and other atoms are not black and white particles, nor does pure chance operate in determining their combinations. Furthermore, the mere fact that an event has only one chance in 2.02×10^{321} of happening does not mean that it will not happen. If it did, a poker game, as William Palmer Taylor (3) pointed out, could not last more than about fifty hands, since that is about the probability that any player will hold the exact five-card hands in the sequence in which he got them.

Post Hoc Arguments

The post hoc type of argument is described by the five Latin words,

post hoc ergo propter hoc, "after this, therefore because of this." The fallacy is in the assumption that if one event or type of event follows another, a causal relationship is indicated. It might be, or again it might not.

Post hoc reasoning is the basis of many superstitions, and for that matter, of magic rituals and formulae. One event is observed to follow another, and a causal relationship is deduced. And the human brain is so constructed that once a plausible theory has captured its imagination, every instance which tends to confirm it is noticed and remembered, while every instance which contradicts it is explained away or forgotten.

The famous curse of Tutankhamen is a good illustration. This Egyptian Pharaoh's tomb was opened in 1922. Shortly thereafter, one of the members of the archaeological party died. The story was circulated that a curse had been laid on anyone who desecrated Tutankhamen's tomb, and that every member of that party was doomed. During the course of the next few years, some of the other members of the party died, and the validity of the curse was thus confirmed. Thereafter the story was revived whenever one of the party passed on. One of them died some 25 years after the event, yet the Sunday supplements came out with the same story, and affirmed that the curse had finally gotten him.

Another post hoc argument was the Spam theory of malaria which was facetiously promulgated in the South Pacific during World War II. The incidence of malaria was high among troops who ate a lot of Spam, while it was relatively low among those who ate fresh meat; hence the conclusion was drawn that malaria is caused by eating Spam.

The theory is fallacious, but the basic facts were true. The explanation is that Spam was eaten in greatest quantity under conditions which made it impossible to get fresh meat. These conditions usually applied during com-

bat and the first period of occupation of new areas. They were also conducive to the breeding of mosquitoes and the transmission of malaria by them, hence the high incidence of the disease. Later on, when the fighting was over, mosquito control measures reduced the transmission of malaria, while at the same time fresh meat again became obtainable.

Post hoc arguments are a constant danger when we interpret statistical relationships. If two things vary together, that is, if their coefficient of correlation is significantly high, we have a tendency to assume that there must be a causal relationship between them. It is possible, yes, but it certainly does not necessarily follow.

Frederick Sargent, II (4) has given an excellent illustration of this. He compared the relationship between the length of the names of the months and the amount of rainfall in Chicago and found that there is more rain in months with short names than in those with long ones. The correlation coefficient between the number of letters in the names of the months and the mean monthly precipitation is -0.611 , which is significant at the 5% level.

Part of the present controversy on the relationship of cigarette smoking to cancer also stems from a difference of opinion on how to interpret the statistics. Some people think that a post hoc fallacy is involved; others don't.

Non Sequitur Arguments

Non sequitur arguments are a step lower than post hoc ones. They are those arguments in which the conclusion does not follow from the premises. "Non sequitur" means, "It does not follow." Whether knowingly or unknowingly we all use non sequitur arguments. Read almost any famous speech of persuasion critically and you will find more than one example.

It requires careful examination to be sure that the conclusions we derive

from a set of premises are not irrelevant. In writing scientific papers, it is easy enough to draw more conclusions from the data than they warrant. Too often, when the results of an experiment do not conflict with a favorite notion, we conclude that they prove it to be correct.

A common type of non sequitur argument in the field of science—and elsewhere, too—can be expressed by the formula, "You are wrong; therefore I am right." The perpetrator proves, perhaps at some length, that the theory held by his opponent is incorrect. His proof may be flawless. Then he says that this proves his own theory is correct. It does nothing of the sort. The next step would be, and often is, for his opponent to prove the first man's theory wrong and to claim that his own theory must therefore be right.

The reverse argument is also common, i.e., the formula "I am right; therefore you are wrong." Often enough both parties can be right. These two *modi operandi* have produced some fine controversies, and will undoubtedly produce still more.

Appeals to Feelings

Altho appeals to feelings have no place in science, they may creep in. Outside of science it is difficult, if not impossible, to avoid them. Think how dull most speeches would be without them; no one would want to listen to political speeches any more. And how could lawyers conduct jury trials? Or how could we ever work up spirit for a football game?

This sort of thing can often be harmless enough, but the late government of Germany gave us a vivid demonstration of what can happen when reason is thrown out and raw emotion rules. Dr. Goebbels and his propaganda agency proved that people believe what the Bellman said in Lewis Carroll's poem, "The Hunting of the Snark":

"Just the place for a Snark!" the
Bellman cried,

As he landed his crew with care;
Supporting each man on the top of
the tide

By a finger entwined in his hair.
"Just the place for a Snark!" I have
said it twice:

That alone should encourage the
crew.

"Just the place for a Snark!" I have
said it thrice:

What I tell you three times is
true.

And of course this idea is basic doctrine for the whole advertising industry.

The appeal to respect for authority is one type of appeal to feelings. It bars progress and promotes intellectual stagnation by discouraging individual initiative and independent thinking.

When governments attempt to confine scientific thought within the boundaries of official political theory, science suffers. It is well known what the Communist government did to genetics in Russia. Led by T. D. Lysenko, it proclaimed that the ideas of modern genetics are not in accord with dialectical materialism and therefore not in accord with Communist theory, and are therefore examples of capitalist fallacy.

And because the laws of probability are basic to Mendelian theory, they are metaphysical and discredited, and must be rooted out of Soviet statistics along with other remnants of bourgeois ideology.

The physiologists are having their troubles, too. A Scientific Council on Problems of the Physiological Theory of Academician I. P. Pavlov has been set up to keep physiologists from straying from the party line, which is ostensibly based on Pavlov's "consistently materialistic theory of higher nervous activity." Physiologists who deny that it is consistently materialistic or anything other than strictly empirical are high on the Russian list of candidates for outer darkness.

Communist philosophy is also apparent in other fields where we wouldn't expect to find it. The theory of resonance in organic chemistry is considered heretical; and bourgeois astronomers are attacked as "completely benighted." (Not a bad description at that, considering their working hours.)

We can contemplate these antics with smug superiority. But we, too, are capable of the same sort of lunacy; we recently exhibited symptoms of it, although of course our emotional bias was in a different direction.

The appeal to authority can be most stuftifying. In the early days of physiology it was thought that oxygen was transported to the tissues dissolved in the blood plasma. In the 1860's the German biochemist F. Hoppe-Seyler showed that it combined with hemoglobin in the red blood cells, and that a much larger amount of oxygen could be carried in this way than in simple solution. What happened to the oxygen when it got to the tissues was not known, but it was assumed that it simply left the hemoglobin and passed into them.

About twenty years after Hoppe-Seyler's discovery, C. A. MacMunn reported that he had found substances in the tissues which resembled hemoglobin. He named them histohaematin and myohaematin.

Hoppe-Seyler, who was now an eminent authority, pooh-poohed MacMunn's discovery. These substances, he said, were simply broken-down products of blood hemoglobin. MacMunn showed that they were present in insect tissues, and of course most insects don't have hemoglobin. But that didn't bother Hoppe-Seyler. The Great Authority simply printed the statement that his opponent was in error and there was no point in discussing the subject further.

And he was believed. Not until the 1920's was it shown that MacMunn had been right. Then D. Keilin found

a substance in the tissues which he called cytochrome and which was the same as MacMunn's substances. Cytochrome occurs in both animals and plants, and is necessary for cellular oxidation. So in this particular line, Authority delayed progress for 40 years (5).

How many instances have there been in all fields of science in which the revolutionary ideas of young or unknown men have been ridiculed by established authorities, and in too many cases have been abandoned, only to be rediscovered and confirmed later on? No one knows, but there must have been many.

The first paper which contributed to understanding how the steam engine operates was written by Robert Mayer about 1840. He sent it to Poggen-dorf's *Annalen*, which turned it down. He finally got it published elsewhere, but no one was interested, and he was asked not to submit any more papers. J. P. Joule, who had announced the law of conservation of energy in 1843, submitted a paper in 1845 to the Royal Society which explained the operation of the steam engine. Two referees who read it decided that it was "mere nonsense" and not worthy of publication (6).

Mendel's discoveries in genetics may be said to fall in this category, too. Mendel published them, to be sure, but he also showed them to the eminent botanist, Nägeli. And Nägeli said patronizingly that although Mendel had made a start, his experiments were far from complete. Considering that Mendel had already worked with more than 10,000 plants, this was discouraging, to say the least (7).

It is easy for even the best of us to fall into fallacy. We know this, and we cultivate a healthy scepticism in our attitude toward our own work and that of others. The motto of science was best stated by two modern non-scientists, George and Ira Gershwin—"IT AIN'T NECESSARILY SO."

REFERENCES AND NOTES

1. M. Black, **Critical thinking: An Introduction to Logic and Scientific Method** (Prentice-Hall, New York, 1946).
2. P. LeComte du Nouy, **Human Destiny** (Longmans, Green & Co., New York, 1947).
3. W. P. Taylor, **Sci. Mon.** 66, 267-269 (1948).
4. F. Sargent, II, **Science** 121, 402 (1955).
5. C. E. K. Mees, **The Path of Science** (J. Wiley & Sons, New York, 1946).
6. E. Ayres, **Amer. Sci.** 43, 521-540 (1955).
7. E. O. Dodson, **Sci. Mon.** 81, 187-195 (1955).

VISUAL ACUITY OF HAMSTERS

By Norma L. Skow
Bucknell University
Lewisburg, Pa.

Visual discrimination of the rat has been tested for a number of years, and a technique for this has been devised by Lashley. Until 1928 investigators of animal vision most widely employed the apparatus originated by Yerkes (1) (Munn) and the data obtained showed rats do not possess good pattern vision. However, Fields questioned the validity of these results and, by means of a new apparatus, was able to obtain positive evidence of it (2) (Munn).

Lashley, in 1930, devised a much simpler technique, using the Lashley jumping stand, and verified Fields results (3). This technique enables the rat to jump directly against the stimuli to be discriminated, the food-seeking activity of the rat being centered on the stimuli. There is a close spacial and temporal proximity between the punishing and the rewarding factors and the act of discrimination.

In testing the visual acuity of hamsters the Lashley jumping stand was first used. However, the hamsters seemed unable to jump, even the shortest distance, and a new method had to be devised for visual discrimination of hamsters. In general, the animal is confronted by two stimuli which differ from each other to a measurable degree. The experimenter arbitrarily decides which stimulus shall be con-

sidered positive. When the animal responds by approaching this stimulus he continues unimpeded to the food box, where he receives a bite of food. When he approaches the other stimulus, he receives punishment.

Materials and Methods

The Magalhaes box (4) consists of a runway leading to two doors, 20 cm. in front of which is a trap door, and behind which the reward is found. The doors are hinged at the bottom so they can be pushed down easily. Cellophane-covered striped cards (of 20mm., 15mm., 10mm., 5mm., 3mm., and 1mm. width stripes) were made to slide into the doors either horizontally or vertically.

For this experiment four male, adult golden hamsters (*Mesocricetus auratus auratus*) were used. Two of the hamsters were trained to run towards the horizontal stripes. When they pushed down the door with the horizontal stripes they were rewarded with peanuts; when they headed towards the door with the vertical stripes they fell through the trap door which was released. The other two hamsters were trained to run towards the vertical stripes.

The first few days preliminary trials were run with no cards, and only one door opened. They were then tested with the 20 mm. stripes with

the doors closed; after ten correct trials the hamsters were tested with the next size striped cards.

The following procedure for testing the visual acuity of hamsters was observed: Food was removed from their cages every evening so that the hamsters would have an incentive to go through the correct door and be rewarded. Since they are most active at night this period provided the equivalent of about one-half day of starvation. Early every morning for five weeks each hamster was tested. The overhead light was turned off, and a spotlight was turned on and focused on the two doors, one door being a positive stimulus and the other being a negative stimulus. The hamster was placed at the far end of the runway facing the doors. If it went to the correct door and pushed it down it was allowed to eat for 10 sec. If it went within 20 cm. of the negative stimulus it was dropped through the trap door. Twenty trials were run daily on each hamster, the positive stimulus being changed from one door to the other according to a pattern.

L. W. Gellerman (1933) (5) reports that chance factors such as habits of alternation may result in accuracy as high as 70%. Orders of alternating stimuli were determined in which the most probable chance score would be 50% correct. In forming a series of 10, each must show the following:

1. 5 right and 5 left
2. At least 2 right and 2 left must appear in both first and last halves of each series.
3. Never more than 3 rights or lefts in succession
4. 5 reversals from right to left or left to right.

The times of each trial and of the 20 trials were recorded, as well as whether or not it was successful, the presence of visitors, and noise, and the starvation time.

Results and Discussion

The results of this experiment show positive evidence of good pattern vi-

sion of hamsters. Since each animal had to complete 10 successively correct trials before the next size-striped cards were used, the animal had to have learned its positive stimuli and be able to discriminate from a distance of 20 cm. or greater.

After five weeks all four of the animals were obtaining approximately 80% accuracy on their trials using the 5mm. cards. One animal was tested with the 3 mm. cards and he obtained an average of 55% over a period of five days. Therefore, at a distance of 20 cm. or greater they could distinguish the 5 mm. stripes.

The starvation time had no noticeable effect on the results of the trials. After nights with no starvation the results were just as good as otherwise. Munn emphasized that when using rats as experimental animals, in order to obtain the best results with the discrimination method the animals must be quite hungry at the beginning of each day's trial (6). However, hamsters differ in that they hoard food; this may account for the good results obtained on the days the hamsters were not starved.

Conclusions

The results of this experiment employing the Magalhaes Box show that golden hamsters possess visual acuity to the extent that they can distinguish 5mm. stripes at a distance of 20 cm. or greater.

References

1. Munn, N. L. 1933. *An Introduction to Animal Psychology; The Behavior of the Rat*. Houghton Mifflin Company, New York. pp. 104-117.
2. *ibid.*
3. *ibid.*
4. The Magalhaes box was designed by Dr. Hulda Magalhaes at Bucknell University, 1955, for use in testing the visual acuity of hamsters.
5. Gellerman, L. W.. 1933. Chance order of alternating stimuli in visual discrimination experiments. *Jour. Genetic Psychol.* 42: 207-208. from Munn's *Handbook of Psychological Research on the Rat*.
6. Munn, N. L., *op cit.*



(Photo courtesy of SCIENCE SERVICE)

Prof. Paul B. Sears, Ph.D., D.Sc., is the President of the American Association for the Advancement of Science. A.B. and B.S. in 1913 at Ohio Wesleyan, A.M. in 1915 at Nebraska, Ph.D. in 1922 at Chicago. Entered Phi Sigma's Alpha Chapter in 1916, was National Chancellor from 1928 to 1933.

CONSERVATION IN CANADA

From Ontario Department of Lands and Forests

TORONTO—Your imagination can kill you if you miss your way in the bush, unless you sit down, relax and say to yourself: "Getting lost isn't funny, but it need not be fatal!"

So says SYLVA, bi-monthly magazine of the Ontario Department of Lands and Forests, in an article in its current issue on one of the many recurrent hazards of the out-of-doors, particularly during the hunting season. Child and adult reaction to being lost differ widely, too, SYLVA finds, and observes:

"A lost child is so pathetic; neither ice cream, candy nor policemen turning somersaults will bring a smile to the tear-streaked face of a tiny tot waiting for 'Mummy'. Every circus, every exhibition, every parade has its quota of strays.

"What youngsters feel when 'lost' is always tempered by the knowledge that 'Mom' and 'Dad' have never failed them—either always materializes out of the dark terror of nightmares to save them. Thus their fears do not take over their reason completely; there is always a hope.

"Grown-ups, however, because they know of what has happened to others, take being 'lost' much harder. Often the experience leaves lasting scars and some will not venture into the bush again, even in company.

"To fear that one will get lost robs many men of the feeling of freedom when 'roughing it' on vacation. Others dare trips for which they are not fitted—and get 'lost' with sad results.

"To get lost is not extraordinary. Almost everyone who enters the bush gets 'mixed up' at times. One must be careful, of course; it's not easy to find your camp or other point of return if you don't keep track of its location in relation to landmarks.

"Before leaving camp, note the direction of all visible hills, valleys, lakes, rivers and roads. Check those

you can't see by referring to your map; are they north, south, east or west? Keep track of your route, especially of changes in direction, using the sun and time of day as a rough guide. In flat country particularly, use your compass—of course you have one with you—and, if necessary, especially if you plan to return by the same route, blaze a tree occasionally in such a way that the blaze will be easily seen on the way back.

"If you do get 'mixed up' in your direction, don't at once call yourself lost. Sit down, light your pipe, relax and think things over. Be nonchalant, like the hold Redskin chief who missed his way and, when found, imperturbably insisted that he was all right. 'Indian not lost—wigwam lost' said he—which, after all, was good psychology. It kept him from doubting and worrying himself to death!

"So, get out your compass and study your map. Go over your route as you remember it and try to reconstruct the course taken since you left a last known point. Almost at once, in most cases, you will note where you took a wrong turn—and in a few minutes will be back on your way.

"If you find you're still somewhat mixed up, calmly determine a plan of action and *stick to it!*—at least until you prove yourself wrong. If several people are together, stay together—even if the majority decision does not satisfy one of the party—because there is always a certain amount of 'safety in numbers'. Searchers will likely locate a party more readily than an individual.

"Compare any visible landmarks with those noted on your topographical map and, with your compass, try to chart a route that will bring you back to camp or to a road, river, lake or railway line where the possibility of communicating with others will be improved.

"But remember that if you have been away from camp for long, search parties will already be looking for you. So stay close to your base for a while and build a smoky fire with damp leaves or grasses on a beach or safe place in a clearing; but don't let your fire get so big or hot that it becomes a forest fire, or your plight will speedily worsen. If you leave your signal fire, be sure to drown it with water until it is permanently *dead out*!

"Should you decide to move about, go straight north from your base and straight back — then northeast and straight back—and so on around the compass until you find a landmark you remember. But be sure to leave notes at your base and at old cabins, forks in streams and so forth, outlining your plans, your direction and whether you intend to return to any point at any time. If you have no paper, drive stakes in the ground in prominent places, with crosspieces pointing the direction taken—or lay stones from the base of a stake in the direction travelled. Blazes on trees will also help the search party.

"If you are by a river and can't remember whether your camp is up or down stream, go upstream first. If you don't find your camp, you can always float down on a log or make-shift raft.

"If possible, use the matches in your waterproof case only to ignite warming fires. Use this fire for cooking if you have caught a fish or animal. Conserve your other food. Don't worry—but keep this thought constantly in mind, that if you miss your way in the bush you have only yourself to fear; no animal in our north woods will assail you.

"To spend a night in the open, even without blankets, will entail no undue hardship during much of the year so long as you make some preparation such as building a lean-to of brush to keep from getting soaked with dew. You will most likely be located in a reasonable time by aircraft or ground searchers or will find your

way out yourself—if you use your map, your compass and your head!

"These are but a few of the many practical things to do when lost recommended by experienced woods travellers. The main thing is to never give into panic and rush blindly about. The hasty traveller is the one who runs into accidents.

"Getting lost may not be funny—but it need not be fatal!"

KAPUSKASING—Forest fire fighters are relishing this story of the cow that got a "hot foot"—or "hot seat".

"While investigating settler fires in the Opasatika area, Art Boice observed a number of cows grazing peacefully in a farmer's pasture," reports District Forester F. E. Sider, of the Ontario Department of Lands and Forests. "Suddenly a cow leaped into the air and high-tailed it to the barn with a series of agonized cries.

"Investigation revealed that a ground fire in an adjacent area of newly-cleared land had burned underneath the ground for a considerable distance and had come up under the unsuspecting cow."

AYLMER, ONT.—Fishing for carp is offered as "an untested field of activity for the angler and the gourmet" by Biologist J. D. Roseborough, of the Ontario Department of Lands and Forests here. Taking of this "coarse" fish is unrestricted in Ontario.

The carp (*Cyprinus carpio*) is known by such other names as European carp, German carp and leather carp. It ranges up to 40 pounds and averages one to three pounds. It has been widely introduced into Ontario waters, spawns in spring and is caught by angling and commercial netting.

"It was first introduced into private waters in the U. S. as early as 1831," says Mr. Roseborough. "Between the time of these private introductions and 1880, the U. S. Fish Commission distributed carp to many of the States, and between 1880 and 1893 also distributed several shipments to Ontario.

The fish was originally protected, as it was considered to be a valuable species for providing a great amount of food.

"Its esteem was quickly lost in Ontario where, shortly after its introduction, all efforts were made to prevent its further spread. Preventing the carp from extending its range in Ontario is certainly desirable. However, attempting to remove it entirely from streams or waters contiguous with the Great Lakes is questionable.

"The carp is a prolific breeder. A mature female may spawn as many as 1,700,000 eggs, as compared with a speckled trout female spawning 1,500 eggs!

"It also finds a favourable environment in streams which are unsuitable for trout because of reduced water flow in the summer, and corresponding increase in water temperature, and because of turbidity caused from erosion of farm lands.

"Because the carp is prolific, and because our lakes and streams have gradually become unsuitable for other fish, we must content ourselves with the idea that this fish is here to stay until some at present unknown method to control its numbers economically is found.

"Good conservation means wise use of our resources. If we face the facts, the best conservation is to use this resource.

"In recent years, the carp has been compared with other foods; the comparison puts this fish in a favourable position. The following table is reprinted from a Wisconsin Conservation Department publication, 'Carp as a Food Fish':

Name	Protein	% Fat	Cal. Lb.
Carp	15.8	4.8	495
Perch	18.4	1.4	402
Trout	17.9	0.7	365
Beef Loin	19.0	19.1	1,155
Chicken	19.3	16.3	1,045

"The fish can be boiled, broiled, baked, pickled, fried or smoked.

"How did the carp wrongly get

such a bad name? It was originally introduced as a food fish. It has been used in Asia for hundreds of years and in Europe it is still considered an excellent food. It is reputed to be a top-ranking sports fish in England, and is even more wary in heavily fished waters than the brown trout.

"Among the small number of southern Ontario carp fishermen, the fish is highly esteemed for both its fight and edibility. The carp is said to be 'jet-propelled' when it is hooked, and it takes an experienced fisherman to land one on light line. It takes patience and ability to hook one in the first place.

"In recent months, many Ontario sports writers have written about the methods of fishing and the choice of baits. They have indicated, too, the undeveloped potential available to the angler who fishes for carp.

"For instance, the trout fly tying enthusiasts can become quite as enthusiastic in preparing a batch of special carp dough-balls as they can in tying a 'Silver Doctor'. The spinning rod addict can put his equipment to excellent use in dropping his bait quietly into a school of carp, and then, if he is lucky, wrestling a 10-pound fish for possession of the line.

"Here is an intested field of activity for the angler and the gourmet. Don't make your decision about carp until you have tried fishing them and eating them. You don't have to wait for your summer holidays to fish them — there are probably carp in that stream in your own backyard!"

(R. V. Whelan in *SYLVIA*, Ontario Dept. of Lands and Forests Magazine)

PARRY SOUND—Among the many problems facing the Fish and Wildlife Division of Ontario's Department of Lands and Forests is how to produce enough fish in lakes and streams to satisfy an increasing number of anglers.

"Lakes, like farms, have a certain productive capacity which can be measured in terms of pounds of fish

per acre per year. This crop, which grows annually, must be shared by its owners, the people of Ontario," District Forester W. E. Gimby here points out. "All who care to may take part in the harvest and, as the numbers of fishermen increase, the return to the individual must necessarily decrease.

"While it might appear that the addition of fish to a lake from one of the Department's hatcheries would increase the number available for the harvest, these fish must also live on the fertility of the lake, and their success may be at the expense of naturally spawned fish. Thus the supply of hatchery fish must be directed to waters where it is known that they will succeed, and where there is known to be a need due to existing natural conditions. Such conditions might include lack of spawning grounds for the existing fish population, winter kill or other inimical circumstances.

"In many of the heavily fished waters of this Province," Mr. Gimby says, "fishermen are gradually changing their fishing philosophy. They are happy to utilize pan fish to supplement their catches of larger game fish. By doing this they are assisting in fisheries management since, by removing pan fish, they can help to favour the development of game fish."

TORONTO — This is the "real" muskie season, according to angling enthusiasts who would sooner catch a single maskinonge than a bucketful of speckled trout—the season for which, of course, has just closed. Experts of the Ontario Department of Lands and Forests agree that Ontario's largest game fish is much more active in the last few weeks of the season than during the hot summer months when they're so sullen and inactive at times that they simply will not hit at any bait.

Just to keep the record straight, the scientific name of the fish is *Esox masquinongy*. Common names include maskinonge, muskellunge, "tiger musky," musky and 'lunge. But no matter

what you call them, there are few fish that fight longer and more viciously than the muskie, experts say, particularly when there's a fall tang in the air. It would be fairly hard to set an average size in Ontario waters, but the striking muskie must average out at perhaps six pounds and go right on up the scale to 50 or even more.

The fish is native only to the waters of eastern North America. It may be found in the St. Lawrence River, westward through the Great Lakes to Lake of the Woods, in Lake St. Clair and Georgian Bay, in the Rideau and Kawartha Lakes, Lake Simcoe, the French River, Pickerel River, Lake Nipissing and Lake Timagami. It is found northward to Lake Abitibi, north of Chapleau, the Thunder Bay district from Schreiber to White River and north to the C.N.R. line. The Rainy River, Eagle Lake and English River also produce them.

They are moody brutes, at times, lying dormant in shallow bays within sight, almost within reach, of exasperated fishermen offering everything from spoons and spinners to live suckers which are a favourite food. At other times they'll hit a plug as soon as it hits the water—or even come out of the water to meet it.

The muskie is a predatory fish, feeding on other fishes. Some claim he'll eat his own weight in fish in a single day. That means that a 40-pound muskie will eat 40 pounds of almost anything that swims in the same water. Yellow perch, suckers, pumpkinseeds, rockbass, bullheads, pickerel, large or smallmouth black bass are all grist to the muskie mill—and he has the teeth to ensure the grinding.

Ontario is one of the few places in the world where live maskinonge are raised for restocking purposes. It's quite a job because, from about the age of two weeks, the muskie must have live food. Hence, in Department of Lands and Forests hatcheries, minnow ponds must be kept to raise minnows to feed the muskies.

NEW BOOKS BY OUR AUTHORS

This section offers brief, mostly uncritical summaries on the general content of recent publications in biological and related fields. Only the longer critical reviews will be signed. Each notice will be preceded, wherever possible, by the L.C. card number for the convenience of librarians.

California Grizzly, by Tracy I. Storer, MU '22, and Lloyd Trevis; University of California Press, Berkeley 4, California. 1955. 335 pp., 38 ill., 1 in color. \$7.50

55-9884

California's emblem, the grizzly bear, is at the present extinct within the confines of the State. It is high time that some zoologist gathered up all the scraps of information about the time when it flourished there for posterity. This book seems to accomplish that task acceptably. It discusses in turn the pre- and historic record of the animal in the area, its physical characteristics and habits, and then proceeds to gather up all the available information as to the relations with the grizzly of the early Indians, of the Spaniards (including their bear and bull-fights), of the Americans, their hunting the grizzly, their capitalizing on it in shows and museums, and a chapter devoted to what is called "Grizzly Lore." There are four excellent appendices covering known specimens, the last records of Californian grizzlies, Indian tribal names for bears, and sources of information. There is also a 26-page bibliography.

The Dynamics of Living Protoplasm, by L. V. Hellbrunn, Beta '19; Academic Press, Inc., 125 East 23rd St., New York 10, N. Y. 1956. 327 pp., 64 figs., 3 tabs. \$6.50

55-12301

This book approaches the physiological side of cellular life from a different angle than we have come to expect from its distinguished author. Here he gathers all the information he has accumulated through his years of research and reading, and assembles it into one continuous and highly coherent story. As the author explains: "I have not tried to write an exhaustive treatise, nor have I tried to impress the reader with ponderous and abstruse data. As simply as possible, I have attempted to show that our present knowledge of the colloid chemistry of protoplasm can help to interpret and to explain some of the most puzzling and intriguing problems that physiologists have to face." As one reads the book, one feels that in his interpretation of the mechanism of energy conversion in the cell, the author really did find its writing more of a pleasure than a drudgery.

First Book of Animals, by the Editors of Scientific American; Simon &

Schuster, Rockefeller Center, 630 Fifth Ave., New York 20, N. Y. 1955. 240 pp. \$1.00

55-12532

Of the twenty-three authors whose collected studies are presented here, T. C. Schneirla, who had part in the writing of the story of the Army Ant, entered Beta Chapter in 1925. His contribution is typical of the whole book. It is one of a series which aims to call attention of its readers to "what is exciting and important in modern research." These articles have formerly appeared in the Scientific American. They are grouped under such interesting sub-titles as: The Balance of Nature, Mating, The Social Insects, The Origin of Species, Physiological Engineering, Flight and Navigation, Insects in the Laboratory, and The Proper Story of Mankind.

Guide to the Reptiles, Amphibians and Fresh-Water Fishes of Florida, by Archie Carr and Coleman J. Goin; University of Florida Press, Stadium Building, Gainesville, Florida. 1955. 341 pp., 67 pl., 30 figs. \$6.50 paper, \$7.50 cloth.

55-11911

It is not generally known that Florida harbors so many cold-blooded animals. Two former officers of Sigma Chapter at Gainesville have produced an engagingly different book to prove it, and to help people identify the, as they put it,—"critters" they catch or see. Excluding occasional cold-blooded indigenous "natives" and even more cold-blooded transient tourists, the itemized list of critters includes species of turtles numbering 35, lizards 25, snakes 60, crocodiles 1, alligators 1, salamanders 29, frogs 28 and fresh-water (fit to drink) fishes 154, a total of 333. (Which ought to justify any zoologist in search of new collecting fields applying to his school for leave of absence!) It might be well to know, also, that the number of plates listed above gives no indication as to how many there really are. Many of the pages have three photographs on them, all of them have at least two.

Handbook of Mammals of Kansas, by E. Raymond Hall; University of Kansas Museum of Natural History, Lawrence, Kansas. 1955. 303 pp., 99 figs., ill., maps. \$1.50 paper, \$4.00 cloth.

In response to many requests to the State Biological Survey for a handbook

covering the mammals of the state, the Director of the Museum, who, incidentally, is one of the earlier members of Kappa Chapter of Phi Sigma, prepared this attractive manual. Since the majority of its users will not be professional zoologists, the approach to each species has had to be more humanized than one would expect from a purely and professionally scientific manual. The state map shaded in with the range of each species, and the thumbnail sketch of North America similarly treated are helpful. The last fifty pages of the book are devoted to hints on collecting, preserving, and labelling specimens, as well as a helpful glossary. The story on the grizzly bear is worth the price of the book alone.

Laboratory Manual for General Botany, by L. P. Coonen and J. D. LaCroix; Wm. C. Brown Co., 915 Main St., Dubuque, Iowa. 1955. 114 pp., 17 pl. \$2.65

The Chairman of the Biology Department at the University of Detroit, and a former member of Wisconsin's Zeta Chapter, here collaborates with one of his assistants to produce their ideal laboratory manual, designed to meet the needs of students in an intensive four-credit course. Large outline drawings are provided to cut down on time usually wasted by less well-oriented students. In addition to the 17 thus provided each manual has a plentiful supply (about 60) of preliminarily ruled drawing sheets. There are 27 exercises in all, the first ten first being devoted to anatomy and physiology of the plants, and the seventeen latter running through the plant kingdom from the Chlorophyceae to the Angiosperms. The opening exercise on use of materials, microscopes, and the need for interpretive ability, are particularly opportune, since we are told: "Johnny Can't Read." Privately we suspect that isn't Johnny's only handicap.

Laboratory Manual for General Botany, by Wilson N. Stewart and Harry J. Fuller; Henry Holt & Co., 383 Madison Ave., New York 17, N. Y. 1956. 62 pp., 18 pl. \$2.25

Revised and adapted from the earlier (1950) version put out by Tippe and Fuller, Iota 1927, this manual looks as though it has survived the classroom wars to a point where it has developed a species of fool-proofness of its own. There are apparently no spectacularly "new wrinkles" to be set up for student edification in the laboratory. The school which has no extensive green

houses, will perhaps have some weedy patches to substitute in their place, but only if the course is given in the Spring semester or quarter. There are excellent plates for labelling the otherwise more time-consuming drawings. This is an expedient which is quite in line with modern practise. One wonders where all the Eagle Scouts who have been trained to observe go to college. The average freshman can't or won't see an ordinary laboratory specimen. As for reproducing it . . .

Microbiology, by W. B. Sarles, W. C. Frazier, J. E. Wilson, and S. G. Knight; Harper & Bros., 49 East 33rd St., New York 16, N. Y. 1956. 491 pp., 72 figs., 10 abs. Price not given.

56-6101

At least the two senior authors of the "Wisconsin" manual of general and applied manual of microbiology or bacteriology, are members of Phi Sigma's Zeta Chapter. Their book first appeared in 1950 and was at once distinguished in that they confined it mostly to the non-disease producing organisms. The rightness of their judgment on this score has paid off, and now we have a revised version, much of whose chapters have been rewritten either completely or for the better part.

Protozoology, by R. P. Hall; Prentice-Hall, Inc., Englewood Cliffs, N. J. 1953. 682 pp. \$10.00

52-14030

Somehow or other we missed this book when it was originally published. A copy purchased for our biological library woke us up to the fact that here was a new textbook and reference for the protozoological shelf that was worth talking about. The author, a former member of Mu Chapter in 1922, modestly suppresses the fact that he is professor of biology at New York University, and has been since 1938. The first 427 pages of his book are devoted to the taxonomic and morphological side of the protozoan picture. With chapter seven he begins the physiological side, and continues it with chapters devoted in turn to heredity, host-parasite relationships, the protozoa of the digestive and urogenital tracts, the blood flagellates, malaria, and a final chapter on immunity and resistance. Each of the fourteen chapters has a separate list of publications cited. These range from 78 to 287, depending largely on the length of the chapter and its nature. Botanists whose protozoological concern is with the Mastigophora might well remember that "chloroplast" is one of their trade terms. It's "green chromatophore" in the protozoological fraternity.



(Photo courtesy of UNIV. PUB. OFF., Norman, Okla.)

Dean Laurence H. Snyder, Sc.D., is President-Elect of the American Association for the Advancement of Science. B.S. in 1922 at Rutgers, M.S. in 1924 and Sc.D. in 1926 at Harvard. He became an Honorary Member of Phi Sigma in Omega Chapter in 1947, and Honorary President in 1953. He is Visiting Professor of Genetics at the University of Hawaii this Spring.

PHI SIGMA TODAY*

By Dr. Karl F. Lagler, National President
University of Michigan

Phi Sigma is the only international biological honor society in existence. It is also the sole representative of its field in the Association of College Honor Societies. Phi Sigma was founded at Ohio State University in 1915 and has grown solidly but conservatively ever since. Present initiates total more than 21,000. The elected membership and chapters are collegiate. All society policies and practices are determined by the members. Active members are mostly students and most often graduate ones.

Society business is transacted at a biennial General Meeting to which each chapter sends a delegate. A National Council is elected by the General Meeting and is typically composed of individuals of professorial rank. This Council serves without financial reward to carry out instructions given in the constitution and imposed on it by the national meetings. The most important office on the Council is that of the Executive Secretary-Treasurer who is responsible essentially for the entire flow of affairs in the Chapters and Council. The second most important national office is that of Editor of the society's house organ, the magazine, the *BIOLOGIST*.

The object of Phi Sigma Society is to stimulate research in the biological sciences. Such stimulation is accomplished in many ways, most of them indirect. All, however, are strengthened by our participation in the Association of College Honor Societies—the A.C.H.S.

As a member of the A.C.H.S., Phi Sigma honors superior scholarship.

This it does in selecting its members from among superior students. It confers distinction for high achievement also through the annual Phi Sigma scholarship awards on each campus where there is a chapter. The awards are given irrespective of membership in the Society. In recognizing achievement it offers encouragement for promising scholars to remain in biology and not to be lured away by more lucrative fields. The future of any science and of mankind is strongly written in the leaders which society produces.

Phi Sigma fosters the spirit of liberal culture. It recognizes that one must specialize in research but it believes that science not founded on broad culture is a house built on sand. A professional biologist must first be a man of letters and philosophy, then a scientist, then a biologist, and finally a specialist in his field. Chapter meetings in student days are of great cultural value to the future biologist.

Phi Sigma stimulates and encourages mental development. Evidence of this is to be seen in the articles and extended series of book reviews which appear in the *BIOLOGIST*. Student members are encouraged to offer essays and stories of research for publication therein. Meetings with feature speakers and pursuant discussions are great assets in mental development of participants. The exchange of ideas and opportunity for brainpicking at chapter meetings are among Phi Sigma's strongest means for stimulating research.

True to the highest ideals of aca-

democratic freedom, Phi Sigma stands for freedom of mind and spirit as well as for democracy of learning.

Phi Sigma provides spiritual and intellectual leadership. This depends very closely on the officers which a chapter elects and hence is a very great and real responsibility of each member.

Phi Sigma associates students of achievement and promise in their field in mutual understanding for the advancement of society in the art of democratic living.

Most certainly, Phi Sigma stimulates worthy attitudes for the improve-

ment of general welfare of each chapter's mother institution.

Phi Sigma also imposes on the members whom it honors high citizenship responsibilities and emphasizes deeper study and discussion of the tradition in American science — its characteristics, ideals and possibilities.

These are some of the ways in which Phi Sigma becomes important in the lives of those whom it honors.

* Address delivered at installation of Beta Beta Chapter, Florida State University, Tallahassee, Fla., Feb. 18, 1956.

CHAPTERS, OFFICERS AND ACTIVITIES

All Phi Sigma Welcomes Beta Beta Chapter



Florida State University's new Biology Building whose occupancy coincided with the Installation of Beta Beta Chapter of Phi Sigma, 18 February 1956.

BETA BETA, OUR NEWEST CHAPTER
 Installed at Florida State University, Tallahassee
 by Drs. Lagler and Orcutt, 18 February 1956



(Photo by Karl Lagler)

From left to right — kneeling: Dr. Robert K. Godfrey, Donald W. Dery, M. S. NeJad, Richard T. Jackson, James M. Thomas; first row, standing: Luis R. Almodovar, Bertie Pittman, Mary Ann Joyner, Dr. R. Winston Menzel, Dr. A. W. Ziegler, Dr. C. S. Nielsen, Robert Lynn, Clarence W. Hardiman, Morris Suggs; back row: Gilbert C. Hughes, Robert Kral, Neil Hulings, Cliff Townsend, James Cockroft, Ronald C. Phillips, George D. Grice.

BETA

—University of Michigan
 Ann Arbor, Michigan

President: Leo C. Vander Beek, Dept. of Botany

Vice-Pres.: Dee C. Taylor, 1441 Univ. Terrace, Ann Arbor, Mich.

Cor. Sec.: John B. Burch, Dept. of Zoology

Rec. Sec.: Llewellyn W. Hillis, Dept. of Botany

Treas.: Robert S. Whitmire, Dept. of Botany

Editor: Joseph K. Kite, Dept. of Bacteriology, East Medical Bldg.

Council Rep.: Dr. Karl F. Lagler, Head, Dept. of Fisheries

Our records are not complete earlier than January, 1944, so I cannot give you full information about our former members. However, one of our

most widely known former members is Dr. Thomas H. Weller who is at present at Harvard Medical School and last year was one of three who jointly received the Nobel Prize in Medicine for the growth of polio virus in tissue culture. This work was the basis for the later development of the Salk polio vaccine.

Three former members of Phi Sigma at the University of Michigan are at present members of the faculty on campus. These are: Dr. Bradley M. Patton, professor of Anatomy and chairman of the Dept. of Anatomy, Dr. Wayne L. Whitaker, associate professor of Anatomy and assistant dean of the Medical School, Dr. Leslie A. White professor of Anthropology and chairman of the Dept. of Anthropology.

Since Beta Chapter of Phi Sigma is
 (Continued on page 106)

THE BIOLOGIST



OFFICERS

OF

PHI

SIGMA,

1916-1956



Year Elected	Honorary President	Council President	Pa I
1916s	_____	(E. Cogan)	_____
1916f	_____	C. I. Reed	_____
1917s	_____	H. Cummins	_____
1921	_____	E. W. Sink	_____
1922	_____	E. W. Sink	_____
1923	_____	W. A. Setchell	_____
1924	_____	I. E. Cutler	_____
1925	_____	I. E. Cutler	_____
1926	_____	I. E. Cutler	_____
1927	_____	I. E. Cutler	_____
1928	_____	P. B. Sears	_____
1929	_____	P. B. Sears	_____
1930	A. G. Ruthven	P. B. Sears	_____
1931	A. G. Ruthven	P. B. Sears	_____
1932	A. G. Ruthven	P. B. Sears	_____
1933s	A. G. Ruthven	P. B. Sears	_____
1933f	A. G. Ruthven	P. A. Warren	_____
1934	A. G. Ruthven	P. A. Warren	_____
1935	A. G. Ruthven	P. A. Warren	_____
1936	A. G. Ruthven	P. A. Warren	_____
1937	A. G. Ruthven	P. A. Warren	_____
1938	A. G. Ruthven	P. A. Warren	_____
1939	A. G. Ruthven	P. A. Warren	_____
1940	L. J. Cole	P. A. Warren	_____
1941	L. J. Cole	P. A. Warren	_____
1942	L. J. Cole	P. A. Warren	_____
1943	L. J. Cole	P. A. Warren	_____
1944	L. J. Cole	P. A. Warren	_____
1945	L. J. Cole	P. A. Warren	_____
1946	L. J. Cole	P. A. Warren	_____
1947	R. B. Goldschmidt	P. A. Warren	_____
1948	R. B. Goldschmidt	A. I. Ortenburger	_____
1949	R. B. Goldschmidt	A. I. Ortenburger	_____
1950	R. B. Goldschmidt	A. I. Ortenburger	_____
1951	H. J. Van Cleave	K. F. Lagler	A. I.
1952	H. J. Van Cleave	K. F. Lagler	A. I.
1953	L. H. Snyder	K. F. Lagler	A. I.
1954	L. H. Snyder	K. F. Lagler	A. I.
1955	L. H. Snyder	K. F. Lagler	A. I.
1956	L. H. Snyder	K. F. Lagler	A. I.

Council
V-Pres.Council
SecretaryCouncil
TreasurerEditor of
BIOLOGIST

A. R. Shadle	R. L. Mudhenk	R. L. Mudhenk	C. I. Reed
	E. H. Stewart	E. H. Stewart	C. I. Reed
C. N. Frey	J. E. Ludwick	E. H. Stewart	C. I. Reed
J. L. Lush	C. I. Reed		E. H. Stewart
J. L. Lush	C. I. Reed	E. H. Stewart	E. H. Stewart
L. E. Noland	C. I. Reed	E. H. Stewart	R. C. Miller
L. E. Noland	C. I. Reed	E. H. Stewart	R. C. Miller
L. E. Noland	C. I. Reed	E. H. Stewart	E. F. Davis
L. E. Noland	C. I. Reed	E. H. Stewart	E. F. Davis
	F. F. Smith, Asst.		
A. M. Keefe	C. I. Reed	E. H. Stewart	E. F. Davis
	F. F. Smith, Asst.		
A. M. Keefe	C. I. Reed	E. H. Stewart	E. F. Davis
	F. F. Smith, Asst.		
A. M. Keefe	A. I. Ortenburger	E. H. Stewart	A. I. Ortenburger
A. M. Keefe	A. I. Ortenburger	E. H. Stewart	A. I. Ortenburger
P. A. Warren	A. I. Ortenburger	E. H. Stewart	A. M. Keefe
P. A. Warren	A. I. Ortenburger	E. H. Stewart	A. M. Keefe
P. A. Warren	A. I. Ortenburger	E. H. Stewart	A. M. Keefe
M. H. Hatch	A. I. Ortenburger	E. H. Stewart	A. M. Keefe
M. H. Hatch	A. I. Ortenburger	E. H. Stewart	A. M. Keefe
M. H. Hatch	A. I. Ortenburger	E. H. Stewart	A. M. Keefe
M. H. Hatch	A. I. Ortenburger	E. H. Stewart	A. M. Keefe
M. H. Hatch	A. I. Ortenburger	E. H. Stewart	A. M. Keefe
M. H. Hatch	A. I. Ortenburger	E. H. Stewart	A. M. Keefe
M. H. Hatch	A. I. Ortenburger	E. H. Stewart	A. M. Keefe
F. A. Barkley	A. I. Ortenburger	E. H. Stewart	A. I. Ortenburger
F. A. Barkley	A. I. Ortenburger	E. H. Stewart	E. Higbee
F. A. Barkley	A. I. Ortenburger	E. H. Stewart	E. Higbee
F. A. Barkley	A. I. Ortenburger	E. H. Stewart	E. Higbee
F. A. Barkley	A. I. Ortenburger	E. H. Stewart	E. Higbee
F. A. Barkley	A. I. Ortenburger	E. H. Stewart	E. Higbee
F. A. Barkley	A. I. Ortenburger	E. H. Stewart	E. Higbee
F. A. Barkley	A. I. Ortenburger	E. H. Stewart	A. M. Keefe
K. F. Lagler	A. I. Ortenburger	E. H. Stewart	A. M. Keefe
K. F. Lagler	H. van der Schalie	E. H. Stewart	A. M. Keefe
K. F. Lagler	H. van der Schalie	E. H. Stewart	A. M. Keefe
K. F. Lagler	H. van der Schalie	E. H. Stewart	A. M. Keefe
E. H. Stewart	H. van der Schalie	T. S. Clare	A. M. Keefe
E. H. Stewart	F. S. Orcutt	T. S. Clare	A. M. Keefe
E. H. Stewart	F. S. Orcutt	T. S. Clare	A. M. Keefe
S. H. Meyer	F. S. Orcutt	F. S. Orcutt	A. M. Keefe
S. H. Meyer	F. S. Orcutt	F. S. Orcutt	A. M. Keefe
S. H. Meyer	F. S. Orcutt	F. S. Orcutt	A. M. Keefe

the oldest active chapter, we thought it might be interesting to include a list of the charter members of the chapter which was founded in Ann Arbor in 1916. The present location and position of all these former members is not known, but perhaps they would be recognized by other Phi Sigma members somewhere in the country.

Charter members: Wilber E. Brotherton, Jr., Frank B. Cotner, Harold Cummins, Robert H. Dott, Harry C. Fortner, Eli A. Gallup, Roland F. Hussey, Remus E. Johnson, William F. Kroener, Howard S. Liddell, William K. Ruble, Harley B. Sherman, Emory W. Sink, Theodore L. Squier.*

As far as records show, the Beta Chapter of Phi Sigma has been continuously active since its establishment in 1916. At present regular monthly meetings are held with presentation of speakers from various phases of biological sciences. This is followed by refreshments and a chance for members to get better acquainted.

At the first program of the current year on October 6, 1955, Dr. Albert C. Spaulding of the Dept. of Anthropology discussed the topic, "Cultural and Biological Evolution." For the second program on November 3, we were fortunate to be able to present in conjunction with the Dept. of Bacteriology, Dr. Jacques Monod from the Pasteur Institute, Paris, France, who spoke on "Enzymatic Adaptation in Bacteria."

On December 8, the annual initiation of new members was conducted at an initiation banquet in the Golden Apples Room of the Tower Hotel in Ann Arbor. Following an impressive induction ceremony, the speaker of the evening, Dr. C. Levinthal of the Dept. of Physics, spoke on some of the work he has done in the study of viruses.

At the January meeting, Dr. George H. Lauff of the Dept. of Zoology discussed "Energy Relations of Aquatic Habitats." In February, Dr. James B. Griffin, chairman of the Dept. of

Anthropology, spoke on "Interrelation of Archaeology and Biology."

One of the highlights of the year's activities has been an annual picnic in the Spring. This has always proved to be a most enjoyable and successful outing, and one we might well recommend to other chapters.

New members who were initiated into the Society in December are as follows: Anatomy — Maynard M. Dowey; Anthropology — Robert L. Carneiro, Gertrude E. Dole, Charles H. McNutt, B. Bruce Powell, Robert L. Stephenson; Bacteriology — Sheila Friedman, Carl P. Herkimer, Yi-Chi Mei; Biological Chemistry—Edward Kravitz; Botany—Lila Abrahamson, Arthur W. Cooper, Mary E. Forrest, Elizabeth F. Gilbert, Richard T. Hanlin, Merle J. Klingensmith, Edwin K. Longpre, Rose A. Overstreet; Natural Resources — Roger W. Bachmann; Paul J. Vidal; Psychology — Bettie Arthur; Zoology — Lee D. Beatty, Donald D. Hurst, Robert J. Kirchen, Alan G. Loughrey, Ted C. Michard, Peter H. Ovenburg, Claire L. Schelske, George A. Solem, John A. Wallwork.

Joseph H. Kite, Jr., Editor

**When last heard from Dr. Brotherton was in the seed business in Bozeman, Mont. Dr. Cotner was at one time professor of Botany at Montana State, and has been head of the Dept. of Botany and Bacteriology since 1944. Dr. Cummins is still with the Dept. of Anatomy at Tulane University, where he heads that department, as well as Microscopic Anatomy, and is assistant dean of the Medical School.*

Dott took his A.M. at Michigan and was last heard from in Oil Geology in Tulsa, Oklahoma. Fortner was practicing medicine in Rochester, N. Y. Gallup was at one time City Forester in Ann Arbor, Mich. Hussey is assistant professor of Entomology at the University of Florida. Remus Johnson once was engaged in practical forestry in Muskegon, Mich. Kroener was last heard from in Orange, Calif. Liddell

is the director of the Behavior Farm Laboratory at Cornell University.

Ruble was last heard from in Wagoner, Okla. Sherman has retired from the acting headship of the Biology Department at the University of Florida and is living in Deland, Fla. Emory W. Sink, once a national officer of Phi Sigma, is now assistant professor of Hygiene and Public Health at the University of Michigan. Squier is on the teaching staff at Marquette University School of Medicine.

A. M. K.

EPSILON

—University of Denver
Denver, Colorado

President: Neil S. Jacobsen, 1432 Downing, Denver 18, Colo.

Vice-Pres.: Gunther Schlager, 1480 S. Bryant, Denver, Colo.

Sec.-Treas.: Elaine Lavonne Munson, 7600 E. Colfax, Denver, Colo.

Council Rep.: Dr. Frederick Zeiner, 1417 S. Elizabeth, Denver, Colo.

Honorary members:— Dr. John Amesse, Prof. T. D. A. Cockerell, Dr. Wilfred H. Dennis, Dr. Jean Jeancon.

Former members who have made good:— Wayne Aspinall, Alfred M. Bailey, Donald Becker, Harland Close, Majory Cutler, William Driscoll, James Dutcher, Llewellyn Evans, Mariana Gardner, R. G. Gustavson, N. Paul Isbell, Abraham Kauver, Robert Niedrach, Theodore W. Torrey, and J. A. Wells.

An honorary biological fraternity, Pi Beta Omega, was organized at the University of Denver on December 19, 1912. The organization received a charter from the state of Colorado dated August 8, 1913, bearing the names of the charter members, Ira E. Cutler, Phillip Munz, Henry Cook, Humphrey Owen, and Albert Dewey. Subsequently, communication was established with Phi Sigma and on March 5, 1917, the first meeting of Epsilon Chapter of Phi Sigma was held. Members at that time were Ira Cutler, H. G. Owen, E. H. Stewart,

L. H. Mahoney, and C. H. Glover. The first initiates of the new chapter were E. B. Working, C. L. Wilson, Paul Hipp, W. N. Aspinall, O. H. Huling, R. L. Shotwell, and E. B. Renaud.*

Professor Cutler was for many years the national president of Phi Sigma and Mr. E. H. Stewart of Mesa, Colo., served Phi Sigma for many years as national treasurer, followed by a term as national vice president. H. G. Owen and E. B. Renaud are now emeritus Professors of Zoology and Anthropology of the University of Denver. Wayne Aspinall is one of Colorado's representatives in Congress.

On December 15, 1926, Epsilon Chapter voted to admit eligible women to membership. Beta Omega Pi, a local honorary biological society for women, became a part of Epsilon Chapter on January 19, 1927.

Although small in size Epsilon Chapter has been functioning continuously now for 39 years as a part of Phi Sigma and for 44 years if we include its predecessor Pi Beta Omega.

Our regular meetings are held twice a month with reports at each meeting by a member on his or her research projects. Following the meetings there are refreshments and a social hour. The outstanding meeting of the spring quarter is the annual field trip and picnic. Initiation and a banquet were held on January 28, 1956, for our three new members, Catherine LeSeney, Wayne Stenback, and Nancy Sweet. The speaker at the banquet was Dr. William Driscoll.

Members transferred to other Phi Sigma schools:— Thomas Wilmoth, University of Colorado Medical Dept.; Josef Prinzing, University of Colorado Medical Dept.; Joseph R. Cruse, University of Colorado Medical Dept.; Keva Levin, University of Colorado Medical Dept.; Jim Denton, University of Colorado Medical Dept.; Wendell Carter, University of Illinois Medical Dept.; and Rudolph deLuise, University of Colorado Medical Dept.

Elaine L. Munson, Secretary
Tepee Trading Post
7600 East Colfax
Denver 8, Colo.

*Dr. Ira Cutler is dead. Erwin H. Stewart lives at Mesa, where he is President of the Trustees of the Grand Junction Colorado Memorial Museum, on Highway 50, next to Uranium Downs. Mahoney was last listed as living in Denver. Working was professionally connected with the Department of Milling at Kansas State University. Carl Wilson is professor of Botany and a textbook author of repute at Dartmouth College. Hipp was last heard from as a citizen of Denver. Huling is assistant professor of Biology at Franklin College, in Indiana. Shotwell is engaged in research on the European cornborer with the U.S.D.A. in Ankeny, Iowa.

A. M. K.

ZETA

—University of Wisconsin
Madison, Wisconsin

President: Clyde Bay, Soils Dept.
Univ. of Wis., Madison, Wis.

Vice Pres.: Duane Benton, Biochemist

Sec.: Marilyn Chaloupka, Home Economics

Treas.: Martha Christensen, Botany
Editor: Twila Strecher, Bacteriology
Council Rep.: Dr. Lowell E. Noland,
151 Birge Hall, Univ. of Wis.

Honorary members:— G. S. Bryan, bacteriologist. L. R. Jones, founder of plant pathology, deceased. E. M. Gilbert, mycologist, chairman of Botany Dept. E. J. Kraus, plant physiologist, practical geneticist. A. S. Pearse, ecologist, department head and graduate Dean at Duke University, retired. E. A. Birge, limnologist, father of American limnology, deceased. L. J. Cole, National Past President of Phi Sigma; founded Genetics Dept., Univ. of Wis., deceased. B. M. Dugger, discovered aureomycin, plant physiologist. E. B. Fred, president of University

of Wisconsin, bacteriologist. G. Wagner, bird-migration specialist, deceased. M. F. Guyer, cytologist; author of biology and histology textbooks. E. G. Hastings, dairy bacteriology, deceased. E. Truog, soil chemist. E. B. Hart, biochemist, deceased. E. Kremers, pharmaceutical chemist, deceased. C. E. Allen, plant cytologist; discovered sex chromosomes in plants, deceased. R. A. Brink, plant geneticist. C. H. Bunting, pathologist in medical school. G. W. Keitt, chairman department of plant pathology. L. G. Graber, agronomy. C. L. Huskins, cytogeneticist, deceased. C. Juday, first president of Limnological Society of America, deceased. W. J. Meek, physiologist, former dean of Medical School at University of Wisconsin.

Successful former members:— O. N. Allen, legume bacteriologist. G. S. Avery, director, Brooklyn Botanical Garden. I. L. Baldwin, vice president, University of Wisconsin. C. A. Baumann, professor of biochemistry. A. A. Boyden, Serological Laboratory, Rutgers University. D. W. Chamberlain, Ag. Research Service, Associate Pathologist, U. S. D. A. L. P. Coonen, Chairman, Dept. of Biology, University of Detroit. C. A. Elvehjem, Dean of Graduate School, Chairman, Dept. of Biochemistry, U. of Wis. W. C. Frazier, Chairman of Bacteriology Dept. I. E. Gray, Head, Dept. of Zoology, Duke University. F. G. Hall, physiologist, Duke University. A. Hollaender, Head, Radiation Biology, AEC, Oak Ridge. F. L. Hisaw, Endocrinologist at Harvard. Rev. A. M. Keefe, ex-dean, St. Norbert College, editor of *The Biologist*. K. P. Link, carbohydrate chemist, Lasker Award 1955. J. L. Lush, professor of Animal Genetics, Iowa State. H. W. Mossman, embryologist. A. E. Murneek, author, prof of plant physiology, Missouri. N. P. Neal, geneticist. L. W. Noland, author, chairman Zoology Dept., past Vice President Phi Sigma. F. S. Orcutt, director of biochemistry and bacteriologist, V.P.I., Secretary-Treasurer

Phi Sigma. O. A. Reinking, emer. prof. Cornell, now F.O.A., Manila. P. I. H. W. Rickett, author, botanist. A. J. Riker, plant pathologist. W. B. Sarles, bacteriologist. P. H. Senn, prof and head, Dept. of Agronomy, Univ. of Florida. W. O. Stover, emeritus prof. plant path., Ohio State. E. L. Tatum, biochemist, Stanford Univ. E. C. Tims, plant pathologist, Louisiana State Univ. A. G. Vestal, author, prof. of botany, Univ. of Ill., Ecology Sec. G. K. Weichert, author, anatomist, head Dept. of Zoology, Univ. of Cincinnati.

Zeta chapter was organized in the year 1917 on the Madison campus. At that time each of the 13 "charter members" paid \$4 for assessment fee, initiation fee, and new member fee. The charter members were: J. N. Lowe, T. C. Nelson, C. L. Vanderbie, W. M. Gibbs, H. L. Fulmer, C. M. Woodworth, W. H. Tisdale, H. W. Browning, G. M. Armstrong, J. P. Bennett, C. N. Frey, M. W. Gardner, J. W. Brann.* In the first year, 11 new members were taken into the organization. Total membership at the close of the academic year, 1917, was 24. Women were not initiated into this chapter until the year 1947. Since its organization in 1917, a total of 1,270 have been initiated into Zeta chapter of Phi Sigma.

A short review of the various speakers and topics scheduled this year will give some idea as to the type of activity Zeta chapter offers to its membership.

The first lecture was presented in October by Dr. Paul Kaesberg, biophysist, on the subject, "Use of the Electron Microscope in Biology." Dr. A. D. Hasler, chairman of the Zoology Dept., discussed his research on the role played by the sense of smell in the migration of fish. His paper also included the use of the sun by fish as a means of orientation. In December, Dr. V. E. Suomi spoke on "Heat and Moisture Budget of Growing Crops." Dr. Suomi, a micro-meteorologist, discussed the moisture requirements of

plants as determined by measurement of the disposition of solar and other heat energy sources. Dr. C. L. Farrar, professor of entomology and apiculturist with the United States Department of Agriculture, sparked the February meeting with an interesting discussion of the behavior of honey bees.

For the March meeting, Zeta chapter is looking forward to hearing Dr. K. B. Raper speak on "Slime Molds."

**Checking Zeta's pre-World War I members who are still listed in the current edition of "American Men of Science" we find:—*

E. M. Gilbert, the oldest charter member, is now head of the Department of Botany at the University. J. N. Lowe died while a professor of Zoology at Marquette State College, Marquette, Mich. W. H. Tisdale is retired in Wilmington, Del., after an active career, mostly with DuPont Chemical Division of Plant Industry. W. M. Gibbs went on into surgery from bacteriology, and is now a member of the University of Southern California Medical School staff. H. W. Browning is Dean of the School of Science at the University of Rhode Island. C. N. Frey spent most of his career in the Fleischmann Yeast Research Laboratory, is now at M.I.T. G. M. Armstrong heads the Division of Botany and Bacteriology at Clemson College. J. P. Bennett is a professor of plant pathology at the University of California. C. L. Vanderbie was last heard from in Los Angeles. C. M. Woodworth is professor of plant genetics at the University of Illinois. J. N. Brann was last heard from before he left the assistant professorship of plant pathology at the University of Wisconsin. T. C. Nelson is professor of zoology at Rutgers. H. W. Fulmer has been lost sight of. Max W. Gardner is professor of plant pathology at the California Experiment Station, Berkeley. M. T. Binney has disappeared from notice. A. E. Cole is professor of anatomy and di-

rector of admissions at the University of Louisville School of Medicine. J. G. Dickson holds a professorship in plant pathology at the University of Wisconsin. S. P. Doolittle is principal pathologist at the U.S.D.A. Horticultural Crops Research Branch, Beltsville, Md. N. J. Giddings also is a U.S.D.A. collaborator in plant pathology and bacteriology at Riverside, Cal. M. C. Gugler has been lost track of. W. C. Kraatz is professor and head of the Department of Biology at the University of Akron. E. W. Roark died in World War I — aviation branch. H. H. Roehm was last reported supervising the sale of milk products at Houghton, Mich. J. E. Simmons has been last heard of as bacteriologist of the Oregon State Experiment Station at Corvallis. W. B. Tisdale is head of the Department of Botany at the University of Florida, Gainesville. J. C. Walker is professor of plant pathology at the University of Wisconsin. C. B. Clevenger was last heard of with the Standard Fruit Co. in Honduras. H. Snell is professor of natural history at Brown University. R. H. Roberts is professor of horticulture at the University of Wisconsin. M. H. Campbell is dean of the College of Agriculture at the University of Rhode Island.

It is presumed that most of the men who no longer appear in the "American Men of Science" either went into industry or have since passed away.

A. M. K.

ETA

—University of Akron
Akron, Ohio

President: Raymond T. Damian,
Dept. of Biology, Univ. of Akron

Vice-Pres.: Thomas Riley, Dept. of
Biology, Univ. of Akron

Sec.: Lois Ahl, Dept. of Biology,
Univ. of Akron

Treas.: Henry Koerber, Dept. of Biol-
ogy, Univ. of Akron

Council Rep.: Walter C. Kraatz,

Head, Dept. of Biology, Univ. of
Akron

In March, 1920, the Axis Society of the University of Akron became interested in the Phi Sigma Society. The Axis Society was composed of men and women interested in biology and scientific work. Errol Fox, a member of Alpha chapter of Phi Sigma Society at Ohio State University and a brother of a member of the Axis Society was instrumental in getting the Axis Society a charter in Phi Sigma.

On May 6, 1920, a petition was sent to E. L. Sink, Grand President of Phi Sigma.

On April 20, 1921, the Axis Society became Eta chapter of Phi Sigma Society. It was the first honorary fraternity on the University of Akron campus.

*Charter members were: Rolland Fox, Claude Emmons, Willard Melvin, Vivien Whigam, Louise Whalen, Lois Waltz, Robert Sawyer, Robert Bordner, Francis Carmichael, and Arno Towne.

The first officers were: Rolland Fox, president; Robert Bordner, vice-president; and Claude Emmons, secretary-treasurer.

The number of Akron University graduates, and Eta alumni, who have received the M.D. degree from various medical schools, comprises over 30 men in Akron and about an equal number in other places. Probably most distinguished are the following:

Harold A. Zintel, B.S., 1934; M. D. 1938, University of Pennsylvania School of Medicine; D.Sc. (in Med.) 1946, University of Pennsylvania School of Medicine. Since July, 1954, is Director of Surgery, St. Luke's Hospital, New York, and Clinical Professor of Surgery, College of Physicians and Surgeons, Columbia University, New York; President, Society of University Surgeons.

Merlin Hayes, B.S. 1929, and B.A. 1930; Ph.D. 1935, Zoology, University of Wisconsin; Associate Professor of Zoology, Milwaukee Center

of the University of Wisconsin.

Sanford Rosenman, B.S. 1936, M.S. 1939, Ph.D. 1942, Ohio State University, in Bacteriology; Wyeth Institute of Applied Biochemistry, Philadelphia, an immunologist.

Fred H. Glenny, B.S. 1936, M.S. 1940, University of Akron; Zoology Ph.D. 1953, Ohio State University; Asst. Prof. of Biology, Youngstown University, Youngstown, Ohio.

Samuel Caplin, B.S. 1939, M.S. 1941, University of Akron, Botany; Ph.D. 1947, University of Chicago; Assistant Prof. of Botany, University of Rochester, Rochester, N. Y.

George Anastos, B.S. 1942; Zoology Entomology, M.S. 1947, Ph.D. 1949, Harvard University; Associate Professor of Zoology, University of Maryland.

C. Richard Weaver, B.S. 1942; Entomology, M.S. 1947, Ph.D. 1950, Ohio State University; Assistant Prof. of Entomology, Ohio State University; Assistant Entomologist and Statistician, Ohio Agricultural Experiment Station, Wooster, Ohio.

Sergius Mamay, B. S. 1944; Paleobotany M.S. 1948, Ph.D. 1950, Washington University, St. Louis; Curator of Plant Fossils, U. S. Geological Survey, U. S. National Museum, Washington.

Ted Suie, B.S. 1948; Bacteriology, M.S. 1950, Ph.D. 1953, Ohio State University; Department of Ophthalmology, College of Medicine, Ohio State University.

Augustus Dycus, B.S. 1948; Botany, Ph.D. 1952, Cornell University; Assistant Professor of Botany, Oberlin College, Oberlin, Ohio.

Harold G. Cassidy, three years at Akron University, Biology; B.S. Oberlin 1930, Chemistry; Organic Chemistry M.S. 1932, Ph.D. 1939 Yale University; Associate Prof. of Chemistry, Yale University.

Bill Barkley, B.S. 1940; Psychology M.S., Ph.D.; Practicing Psychologist.

**Rolland Fox was for some time*

professor of bacteriology at the University of Akron. Claude Emmons practiced law in Akron. Melvin went into the Service and was with the pre-war II Army for some time in the Philippines. Whigam became Mrs. Maynard Flickinger and lived in Akron. Whalen became a teacher in the same city. Waltz also lived in Akron. Sawyer was last heard from as the superintendent of the Ohio Pond Lily Gardens. Bordner went into journalism with the Cleveland "Press." Francis Carmichael dropped out of circulation. Towne is professor of ophthalmology at Jefferson Medical College.

A. M. K.

KAPPA

—University of Kansas
Lawrence, Kansas

President: Leland E. Keller, Anatomy Dept. Univ. of Kansas

Vice-Pres.: Peter S. Chrapliwy, Zoology Dept.

Cor. Sec.: John M. Legler, Zoology Dept.

Rec. Sec.: Richard W. Fredrickson, Entomology Dept.

Treas.: Diana B. Amoss, Biochemistry Dept.

Editor: Richard C. Fleming, Zoology Dept.

Council Rep.: Mrs. Ruth E. McNair, Biology Dept., Univ. of Kansas

Our current activities are varied and interesting thanks to the responsiveness of the chapter members and the willing cooperation of the faculty members in all our biological departments.

Our first lecture of the previous fall semester was an illustrated talk by Dr. Theodore G. Metcalf of the Dept. of Bacteriology who spoke on some aspects of a field trip through Alaska.

The second meeting included a thought provoking symposium entitled, "What Scientific Background Should a Physician Have?" Dr. Vernon Wilson, assistant dean of the

University of Kansas Medical Center, Dr. Kenneth Jochim, assistant dean of the School of Medicine at Lawrence, and Dr. Paul Roofe, chairman of the Dept. of Anatomy, presented this discussion.

"The Biological Effects of Radiation" was the title of a lecture presented by Dr. Frank Hoecker of the Dept. of Biophysics at our third general meeting.

The first meeting of the present semester will include a public discussion entitled, "Which Is More Scientific, Physics or Biology?" Dr. A. B. Leonard of the Dept. of Zoology, Dr. Max Dresden of the Dept. of Physics, and Dr. Robert F. Schofield of the Dept. of History will form the panel, and Syd Anderson of the Dept. of Zoology will act as moderator.

Our chapter is in the process of planning many more up-to-date and pertinent talks and discussions for the spring months to come. We find *The Biologist* a great help in obtaining new ideas and we sincerely hope our contribution to *The Biologist* might be equally beneficial to some of the other chapters.

The Kappa chapter of Phi Sigma at the University of Kansas was organized by Dr. Carlos I. Reed of the Dept. of Physiology. Dr. Reed came to the University of Kansas from the University of Ohio and so in 1920 he started Phi Sigma on this campus as a member of the Alpha chapter. The embryo society grew during the first year with such rapidity that the need for the organization of a separate chapter was apparent. Therefore on May 31, 1921, the Kappa chapter of Phi Sigma at the University of Kansas was formed and recognized.

Through the years the list of people who have been or are now members of this chapter, and who have made notable contributions to biological progress, is so extensive that such a list must be limited to chapter members who are at present on the staff at the University of Kansas. They are:

Dr. Kathleen Doering, Entomology; Dr. Cora M. Downs, Bacteriology; Dr. W. H. Horr, Botany; Dr. E. L. Treece, Bacteriology; Dr. W. J. Baumgartner, Zoology; Dr. H. B. Hungerford, Entomology; Dr. N. P. Sherwood, Bacteriology; Dr. O. O. Stoland, Physiology; Dr. R. H. Beamer, Entomology; Miss L. Walling, Physiology; Miss M. Schumann, Anatomy; Dr. R. M. Isenberger, Medical School.

Richard C. Fleming, Editor

LAMBDA

—Montana State University
Missoula, Montana

President: Richard Fevold, Zoology Dept., Montana State Univ.
Vice-Pres.: Lawrence M. Blakely, South Hall, Montana State Univ.
Cor. Sec.: Mrs. Irene Sammons, Route 2, Missoula, Mont.
Rec. Sec., Treas.: Miss Martha Lowe, Route 4, Missoula, Mont.
Faculty Advisors: Dr. Rueben A. Diettert, Botany Dept.; Dr. Royal B. Brunson, Zoology, Montana State Univ.

NU

—Washington and Jefferson College
Washington, Pa.

President: H. Glenn Hostetter, Phi Kappa Psi
Vice-Pres.: C. Richard Koch, Alpha Tau Omega
Sec.: Thomas J. Carroll, Phi Kappa Sigma
Treas.: Samuel G. Morosco, 870 Jefferson Ave., Washington, Pa.
Editor: Fred C. Cristofori, Beta Theta Pi
Council Rep.: Dr. C. D. Dieter, Dept. of Biology

Honorary Members:

The Honorable Gifford Pinchot, former governor of Pennsylvania and a pioneer in forestry conservation.

The late Professor A. E. Ortmann, curator of invertebrates at the Car-

negie Museum in Pittsburgh and an outstanding animal geographer.

Dr. O. E. Jennings, curator of the erbarium of the Carnegie Museum and professor of biology at the University of Pittsburgh.

Dr. Charles B. Davenport, one of the founders of the Eugenics Record Office at Cold Springs Harbor.

The late Dr. William J. Holland, former director of the Carnegie Museum.

The late Dr. Edwin Linton, outstanding parasitologist and helminthologist.

The late Father Julius A. Nieuwland, chemist and biologist at Notre Dame University.

Dr. J. D. Long, now with the United States Public Health Service.

Dr. Edwin M. Weyer, professor of Philosophy, emeritus, at Washington and Jefferson College.

Outstanding Former Members:

Dr. James D. Ebert, director of the Dept. of Embryology at Carnegie Institute of Washington in Baltimore, Md.

Dr. William H. Ewing, with the United States Public Health Service in the field of bacteriology.

Dr. Charles Ely, associate professor of anatomy at Columbia University.

Dr. Hiram J. Bush, with the United States Public Health Service doing research on malarial control.

Dr. Harry Everhart, associate professor of biology at the University of Maine.

Edward Weyer, outstanding anthropologist and editor of *Nature* magazine.

L. Hughes Hetherington, head of the Maryland State Department of Health and a specialist in tuberculosis.

Dr. William Edwin Abbott, outstanding surgeon at Cleveland, Ohio, and author of many articles on the heart and the vascular system.

History of Nu Chapter:

Nu chapter of Phi Sigma at Washington and Jefferson College was granted its charter on April 19, 1922, and it has been in continuous exist-

ence ever since. Previous to that time the Biology Dept. had sponsored a "Darwinian Society."

Nu chapter has been holding regular meetings during the academic year for the purpose of reporting on and discussing biological topics of current interest.

Nu chapter now has 419 alumni members, 33 active undergraduate members, and four active faculty members: Dr. C. Dewey Dieter, Dr. Homer C. Porter, Mr. B. George Osterman, and Mr. Kirk McCullough.

Nu chapter's faculty advisor is Dr. C. Dewey Dieter, head of the Dept. of Biology and president of the Washington County Health Society, and on the board of the Pennsylvania Tuberculosis and Health Society.

Nu chapter has performed many service projects in the past including: Entertaining the Pennsylvania Academy of Science, holding open house for the Biology Dept. and the College, holding an open meeting with the Washington County Medical Society, and holding an open meeting in co-operation with the Washington branch of the American Cancer Society.

Initiation for 21 new members of Nu chapter was held November 15, 1955. Following the ceremony, a banquet was held at which A. E. Seaman, a biological consultant, delivered a talk about his profession, including his work with fresh water fisheries.

Each year a central topic in the field of biology of particular significance and interest is chosen, and this becomes the theme of our reports and discussions. Last year our topic was "Blood." Blood was examined by different students from various aspects including: history, evolution, genetics, mechanics, physiology, and pathology.

The topic for the current year is, "The Nobel Prize Winners in Medicine and Physiology." From 1901 to 1955 there have been 45 Nobel prizes awarded in these two fields. Most of the men, their award-winning contributions, and the consequences and practical value of their discoveries will

be reported on and discussed in the weekly meetings.

November 15 initiates were: David Frank Alter, Allan Benjamin Barbarosh, Robert Harvey Barnhard, Victor Samuel Behar, Barry Robert Berkey, Arthur David Brimberg, Robert M. Chalfin, Robert Ralph Conte, Arthur Franklin Gross, Chester Sidney Handelman, Richard Irving Hardy, James Stanley Horewitz, Sigmund Martin Horowitz, Jay Lee Jenkins, Carl Thomas Marnatti, Carl Henry Neuman, William Edward Novogradac, Emilio Anthony Roncace, David Hillel Rosenstein, Joseph Daniel Sapira, Bernard M. Sjoberg, Jr.

Thomas J. Carroll, Secretary

PI

—Emory University
Emory University, Georgia

Council Rep.: Dr. W. Baker, Biology Dept.

RHO

—University of Illinois
Urbana, Illinois

Council Rep.: Prof. Norman D. Levine, 163 Veterinary Med. Bldg.

SIGMA

—University of Florida
Gainesville, Florida

President: Claude T. Adams, Sr., Dept. of Biology

Vice-Pres.: T. R. Hellier, Jr., Dept. of Biology

Cor. Sec.: Ruth Bronsweig, Dept. of Biology

Rec. Sec.: C. D. Wilder, Dept. of Biology

Treas.: John C. McCoy, Dept. of Biology

Editor: A. P. Black, Dept. of Animal Husbandry and Nutrition

Council Rep.: Prof. A. S. Muller, Plant Pathology

On January 7 Sigma accepted the following new members:

William Yancey Bennett, Anne

Payne Cawthon, Roy A. Crossman, Jr., Paul Richard Crowson, George Kelso Davis (faculty), Lawrence Edwin Davis, Juan Bautista Ferrer, John Richardson Freeman, J. Alan Holman, James Nathaniel Layne (faculty), George William Miskimen, Larry Harmon Ogren, Carlos Manuel Puentes Garcia, Anne Elizabeth Schwarz, Ray Louis Shirley (faculty), Leon Gijs van Weerd, Robert David Weigel, Ralph William White, Jr., Alan Gordon Witherspoon and Lillian Yu.

UPSILON

—Miami University
Oxford, Ohio

President: Michael Bilitch, 315 Upham Hall

Vice-Pres.: Ronald Gauch, 107 Upham Hall

Cor. Sec.: Ruth Dunn, 214 Richard Hall

Treas.: Jerome Miksche, 200 Upham Hall

Editor: Joyce Bowling, 228 Richard Hall

Council Rep.: Dr. D. T. Maunder, Ass. Prof. Bacteriology, 311 Upham Hall

Honorary Member:

Dr. Millard S. Markle (1931; Earlham College)

Former Charter Members:

Dr. Paul J. Kramer, Botany Dept., Duke University.

Dr. Jean M. Stevenson, surgeon; instructor at the University of Cincinnati Medical School.

David M. Delo, President of Wagner College, Staten Island, N. Y.

Gilbert L. Stout, assistant chief at the Bureau of Plant Pathology, Sacramento, Calif.

Dr. Robert A. Hefner, chairman of the Dept. of Zoology, Miami University, Oxford, Ohio.

Dr. William H. Shideler, chairman of the Dept. of Geology, Miami University, Oxford, Ohio.

Dr. Walter C. McNelly, chairman of the Dept. of Physiology, Miami University, Oxford, Ohio.

Dr. C. Ray Wilson, chairman of the Dept. of History, Colgate University.

Dr. Don B. Creager, horticulturist, gladiolus specialist.

Phi Epsilon, natural science honorary, was established in 1921 at Miami University. May 7 of the same year, Dr. Van Cleave of the University of Illinois installed Upsilon chapter of Phi Sigma in place of the local honorary. Women were first invited to membership in December, 1926. An award given to an outstanding student in the biological sciences was established in the '30's and is still awarded each May by the society. The most lasting tradition that has been observed since the beginning of the organization is the spring picnic. It has been held each year and is enjoyed by faculty members, students, and guests.

The Miami chapter has sponsored a variety of programs this year which have been open to the entire student body. Movies concerning medical technology training and Ohio wildlife conservation were shown. A panel consisting of one member from each of the departments of science discussed the topic, "Current Modes of Scientific Thought" before an interested audience of students and faculty members. One of our most recent speakers was the Rev. A. W. Kershaw who considered the relationship between science and religion. An interesting and informative lecture, "Recent Progress in Photosynthesis," was given by Dr. Glenn R. Noggle of the Kettering Foundation. Later during this semester, various graduate students will report on their research problems and projects.

The members of the chapter are planning a trip to the Wright-Patterson Airfield and Experimental Laboratories in Dayton, Ohio. Also, plans are underway for a weekend camping trip to one of the nearby state parks.

Recently initiated into the society were: Thelma Anderson, Nancy Atkinson, Margaret Ann Berry, William A. Brown, Charles Buckler, Carl Burk,

Jerold Bushong, Joann Drake, Don Fink, John Gorham, Bev Green, Pat McConnell, Elihu Morlidge, Allen Strong, and Leigh Van Velen.

May 7, 1956, will be Upsilon's 30th anniversary. We are planning a banquet for the occasion and have been contacting the charter members in hopes that many of them will be able to be with us at the celebration. Three of the charter members are members of Miami University's staff, Dr. Robert A. Hefner, chairman of the Zoology Dept.; Dr. William H. Shideler, chairman of the Geology Dept.; and Dr. Walter C. McNelly, chairman of the Physiology Dept. Dr. Shideler, who has taught at this university for 40 years, is retiring this year.

Joyce Lee Bowling, Editor

PHI

—University of New Hampshire
Durham, New Hampshire

President: William Oliver, Alpha Gamma Rho, Durham, N. H.

Vice-Pres.: Gino Trevesani, Dept. of Zoology, Nesmith Hall, Univ. of New Hampshire

Cor. Sec.: Peter Allen, West Hall, Durham, N. H.

Rec. Sec.: William Pike, Alpha Tau Omega, Durham, N. H.

Treas.: William Zeedyk, Englehardt Hall, Durham, N. H.

Council Rep.: Dr. Dorothy Travis, Dept. of Zoology, Nesmith Hall, Univ. of New Hampshire

CHI

—Montana State College
Bozeman, Montana

President: Mary Parker, 317 South 8th Ave., Bozeman, Mont.

Vice-Pres.: Miss Kiyoe Kotake, 1119 South 5th Ave., Bozeman, Mont.

Sec.: Marian Hookham, Quad C, Bozeman, Mont.

Treas.: Don Kenczcka, 13 A St., Bozeman, Mont.

Editor: Marion Hookham

Council Rep.: Dr. McBee, Lewis Hall,
Campus, Montana State College

PSI

—University of Washington
Seattle, Washington

President: Lorraine M. Pilon, Zoology
Dept., Univ. of Washington

Vice-Pres.: Richard Anderson, Micro-
biology Dept.

Sec.: Betty Jean Kautz, Anatomy
Dept.

Treas.: Neil G. McCormick, Micro-
biology Dept.

Editor: Fred L. Clogston, Zoology
Dept.

Faculty Rep.: Dr. Melville H. Hatch,
Dept. of Zoology, Univ. of Wash-
ington

Honorary Members:

Dr. Haaken Hasberg Gran, Oslo,
Norway; initiated August, 1930.

Dr. Thomas Husten MacBride (de-
ceased), Botany; initiated December
18, 1931.

The Psi chapter of Phi Sigma was installed April 7, 1928, at the Wilsonian Hotel. Dr. Robert C. Miller (Mu), who since 1938 has been director of the California Academy of Sciences in San Francisco, was largely responsible for bringing together the students who became the first Phi Sigma group at the University of Washington, and he was a leading spirit during the chapter's first years. During these years, the meetings almost invariably took the form of banquets at one or another of the hotels or eating houses in the University district, and especially elaborate were the Christmas parties at the close of the Autumn Quarter and the final meetings of the year in late May or June. During these early years, likewise, a number of summer meetings were held at the Puget Sound Biological Station (later the University of Washington Oceanographic Laboratories) at Friday Harbor.

Especially influential in the life of

the organization at this time was Dr. Helen J. Werby, later associated with the Department of Biology at Seattle University. It has been characteristic of the society throughout that it has involved nearly all the biologists on the campus, both students and faculty, a considerable part in guiding the affairs of the chapter and, from 1933 Dr. Melville Hatch (Beta) also played to 1939, served as the Society's National Vice-Chancellor. For many years now he has been our council representative and helpful advisor.

The programs have usually consisted of a scientific talk by some faculty member, but there was a time during the mid-thirties when a number of local physicians gave a most interesting series of discussions on some of the more general biological aspects of medicine. Today we have continued with scientific talks intermingled with tours—of scientific interest—and trips to the Friday Harbor Biological Station.

The year 1944 found the Society in the process of disintegration, as a result of the lack of advanced students due to the war. A number of faculty and alumni members, including Gertrude Minsk of the University Library, now Mrs. Walter Lemann of Baton Rouge, and Mrs. Martha Flahaut (recently deceased) of the State Museum, cooperated with Dr. Hatch in keeping the chapter alive by holding a series of evening meetings during the next year or so, in his home. Eventually an increasing attendance required the removal of the meetings once again to the campus, where they have been held at the rate of about six a year in the Student Union Building, the YMCA, and lately in the various University buildings.

Psi chapter has aided in the founding of three chapters in the northwest area. In the early 1930's, the Washington State College chapter was started in Pullman, Wash.; in 1933, the Oregon State chapter in Corvallis, Ore.; and in 1948, the College of

Puget Sound chapter in Tacoma, Wash.

Lately we have tried to hold programs of general interest to anyone, as well as programs within the fields covered by Phi Sigma membership. During the summer we held our meeting at the Friday Harbor Biological Station in the San Jaun Islands of Puget Sound. Besides having a beautiful scenic trip by boat through the islands, we heard talks on various subjects by people from Canada, Washington, Oregon, and Massachusetts, and took part in the annual San Jaun salmon bake. The speakers gave a short resume of their own special fields (fisheries, botany, etc.), what they have been working on in particular, and how the advantages of the Biological Station aided them in their work.

Because our meetings have been slowly diminishing in membership again, as happened in the middle 1940's, we will probably revert to holding them in Dr. Hatch's home, thereby making a more informal meeting. We are thinking about planning a joint meeting with the College of Puget Sound chapter in the near future which should give the memberships a chance to become acquainted and to compare notes.

Lorraine M. Pilon,
President, Psi Chapter

OMEGA

—University of Oklahoma
Norman, Oklahoma

President: Vernon Scholes, Plant Science Dept.

Vice-Pres.: Janice Friday, Plant Science Dept.

Cor. Sec.: Don Baepler, Zoology Dept.

Rec. Sec.: Shirley Wolfenburger, Dept. of Plant Science

Treas.: Lothar Hornuff, Dept. of Zoology

Editor: Sandra Stippich, 640 Elm St.
Council Rep.: Dr. A. I. Ortenburger, Zoology Dept.

ALPHA ALPHA

—University of Southern California
Los Angeles, California

President: William Howard Craig
Vice-Pres., Editor: Ormond G. Mitchell

Sec.: Sara Jean Christensen

Treas.: Mary Ellen Moulton

Faculty Sponsor: Dr. Harrison M. Kurtz

Campus Rep.: Dr. William V. Mayer

For Alpha Alpha chapter, dated May 27, 1955, Lorraine A. Hartford.

For Alpha Alpha chapter, dated December 8, 1955: Jerry Philip Andes, Ruth Lillian Bass, Gordon Breiman, Hallie Flowers Bundy, Sara Jean Christensen, William Howard Craig, Brabara Ann Frank, Don Richard Goe, Margarite Rose Kilchmann, Ormond Glenn Mitchell, Mary Ellen Moulton, Rita Louise Paldine, Richard Julian Ralls, Ronald L. Searcy, Kenneth Earl Stager.

ALPHA BETA

—Mount Union College
Alliance, Ohio

President: Richard Untch, 2444 South Linden Ave., Alliance, Ohio

Vice-Pres.: Edwin Bowers, R. D. 1, Sawburg Road, Alliance, Ohio

Sec.: Walter N. Webb, 2330 South Seneca St., Alliance, Ohio

Treas.: Joshua Odetoyinbo, Mount Union College, Alliance, Ohio

Council Rep.: Prof. O. H. Engle, 1409 Robinwood Road, Alliance, Ohio

Honorary Members:

Dr. A. V. Hunninen and Prof. Carl Scheel, former faculty members; Dr. J. L. Blount, assistant professor of biology, and Dr. G. R. Norris, head, Dept. of Biology, both of Mount Union College.

Former Members:

Carl Johnson, B.S., D.Sc., Johns Hopkins, parasitology; M.D., Leland Stanford; head, Gorgas Institute, Pan-

ama, Canal Zone.

William Swezey, B.S., D.Sc., Johns Hopkins, parasitology; professor of zoology, Grove City College, Grove City, Pa.

Oliver Fellows, B.S., Ph.D., Ohio State, bacteriology; Government Research Lab, Southold, Long Island, N. Y.

Myron Sturgeon, B.S., Ph.D., Ohio State, geology; head, Dept. of Geology, Ohio University, Athens, Ohio.

Long Woon Whong, B.S., M.D., Pittsburgh; acting director of the Presbyterian Mission Hospital, Taegu, Korea. He was one of ten Korean doctors sent to the School of Public Health, Harvard University, by the U. S. Government in 1946.

Alan Donaldson, B.S., D.Sc., Johns Hopkins, parasitology; U. S. Public Health Service's Communicable Disease Center, Decatur, Ga.; president, Atlanta Branch Commissioned Officers' Ass'n of U. S. Public Health Service (1956).

Robert Bryden, B.S., Ph.D., Vanderbilt; assistant professor of biology, Tennessee State College, Murfreesboro, Tenn.

Edmund Hunter, B.S., Ph.D., Washington University; professor in Dept. of Pharmacology, Washington University Medical School.

Edwin Ross, B.S., M.A., Washington University, hospital administration; assistant director, University Hospital, Cleveland, Ohio.

Chester Benjamin, B.S., Ph.D., State University of Iowa, botany; research mycologist, Northern Research Lab., U. S. Department of Agriculture, Peoria, Ill.

Thomas Dunstan, B.S., M.A., Pittsburgh University, hospital administration; hospital administrator, Huron Road Hospital, Cleveland, Ohio.

Henry Cramblett, B.S., M.D., Cincinnati School of Medicine; winner, Stella Feis Hoffheimer Memorial Prize at University of Cincinnati School of Medicine; clinical research, National Institute of Health, Bethesda, Md.

On April 4, 1928, the Alpha Beta chapter of the Phi Sigma Society was granted to the old Beta Lambda Fraternitq (local Biology club) by the National Council of the Phi Sigma Society.

On May 16, 1928, the Alpha Beta chapter was installed by Dr. R. D. Fox, professor of bacteriology, from the Eta chapter of Akron University.

Our charter members included 19 students and two faculty members, Dr. J. M. Scott, now deceased, and Prof. O. H. Engle. Ten of the 19 student charter members have secured their M. D. degrees. The present council representative is a charter member. Alpha Beta chapter has an excellent record for its number of alumni securing the M.D. and D.Ds. degrees.

Meetings are held every other month with speakers from our Biology faculty or well-known medical doctors, dentists, opticians, hospital administrators, etc., from Alliance and vicinity.

The majority of our Phi Sigma members are doing research problems.

Members from our chapter who have transferred recently to other Phi Sigma chapters: Miss Tse Wei Chu, B.S. '52 transferred '54 to Beta chapter, University of Michigan.

Prof. O. H. Engle, Assoc.
Prof. of Biology
Mount Union College
Council Representative and
Charter Member

ALPHA EPSILON

—University of Pittsburgh
Pittsburgh 13, Pennsylvania

Council Rep.: Dr. Peter Grey, Head,
Dept. of Biological Sciences

ALPHA ETA

—Oklahoma A. & M.
Stillwater, Oklahoma

President: Charles Basham, 619 W.
3rd st., Stillwater, Okla.

Vice-Pres.: John Beavers, Box 65,

Vet Village, Stillwater, Okla.
Sec.: Jack L. Griffith, Box 182, Vet
 Village, Stillwater, Okla.
Treas.: Harold Powers, Veterinary
 Clinic, A. & M. College
Editor: Lucy Mahlstedt, 213 Willard
 Hall, Oklahoma A. & M. College
Council Rep.: Prof. E. R. Berousek,
 Dairy Dept., A. & M. College

Joan Liebenheim Webb received the Neil Woodward Award for the outstanding freshman student at the University of Oklahoma Medical School. Mrs. Webb is a 1953 graduate of Oklahoma A. & M. and a member of Phi Sigma.

Dr. Harry Orr, dean of the School of Veterinary Medicine at Oklahoma A. & M., died Jan. 14, 1956. Dr. Orr had been with the college since 1927 and was a member of Phi Sigma.

ALPHA IOTA

—Bucknell University
 Lewisburg, Pennsylvania

President: Lydia Tiemann, Box
 357-W, Bucknell Univ.
Vice-Pres.: Barbara Lippincott, Box
 357-W, Bucknell Univ.
Sec.-Treas.: Barbara Josenhans, Box
 53-W, Bucknell Univ.
Editor: Barbara Lippincott
Council Rep.: Roy C. Tasker, Prof.
 of Biology, 431 Taylor Hall, Buck-
 nell Univ.

Alpha Iota chapter was installed Jan. 9, 1932. The chapter has been primarily an undergraduate group, but has always stressed research projects and the students have consistently been required to write up their research results (done under the direction of some faculty member) and read them to the assembled chapter members, as part of the requirement for initiation. Activity lapsed during 1943-46 because of the war activities and the fact that so few men were allowed to continue through graduation and the girls were carrying the burden of extracurricular activities. Revival of interest

and activity in the spring of 1947 has been maintained and even better research projects have been the result. Papers through these years cover nearly every phase of biology, including behavioral work and biochemistry.

As a part of the 20th anniversary observation of Alpha Iota's founding one student compiled a "20-year History" and through questionnaires and interviews brought together information on the accomplishments of many of the former members—226 having been initiated up to that time. It is planned to make even more effort to thoroughly canvass our alumni for the 25th anniversary in 1957 at which time the number of initiates will have reached something over 300.

Activities for the present year included a visit of chapter members to the newly organized Pennsylvania State chapter when a mutually provided program was enjoyed, as a return gesture to one held last year when the Penn State members (not then initiated) came to Bucknell for a similar program. A delegation went to Penn State for the installation of that chapter last spring.

List of Former Members:

John Winter Rice, Chairman of Department of Biology, Bucknell University. Bacteriologist; published 12 papers on bacteriology of milk and paper food containers.

Lester P. Fowle, University Physician, Bucknell University. A national authority on skin diseases and dermatology.

Eleanor Schooley Bly, Ph.D. Bacteriologist in charge of laboratory at Williamsport General Hospital, Williamsport, Pa.

Howard F. D. Moser, prominent physician in Philadelphia.

John Luther Mohr, protozoologist. Had charge of large section of medical work in South Pacific during the war that dealt with communicable protozoan diseases. An expert on dinoflagellates. Also in the Point Barrow Arctic Research Laboratory.

Herbert Allen Wenner, research biologist, Yale University. Expert on work of vectors of polio. At least 42 papers published.

William P. Boger, M.D. as Head of the research program of Sharpe & Dohme, Philadelphia. Has published 60 articles, primarily in the field of chemotherapy.

William Frank Elias, doctor and Director of Research in Antibiotics, Wyeth, Inc., Pharmaceutical Co., Philadelphia.

John T. Szypulski, tuberculosis authority. M.D. in Harrisburg, Pa.

Tilman Harrison Foust, M.D., heart specialist, Harrisburg, Pa.

Thomas Morton Little, research geneticist, Burpee Seed Co.

Kenneth Herrold, Ph.D. Professor of Adult Education, Columbia University. President's Commission on Child Welfare. Expert in child development and psychiatric treatment for children.

Maxwell Howard Kolodny, M. D. in Columbia University School of Public Health. Sent by U. S. Government to Porto Rico on Sanitary Commission.

Stewart Bruce Kephart, M.D., prominent obstetrician and gynecologist of Buffington, Ind.

Edward F. Rabe, M.D. Pediatrician on staff of Geisinger Hospital, Danville, Pa.

Howard Joseph Merrion, Head Bacteriologist, Wyeth Inc., Pharmaceutical Co.

Richard C. Snyder, Ph.D. Professor of biology, Seattle. Expert on birds.

Charles F. Bond, professor of zoology, University of Vermont. 1955-56 Research Fellow in Conservation, Cornell University—Danforth Fellow.

George John Schumacher, Ph.D., professor of botany, Harpur College, Binghamton, N. Y.

Edwin Lewis Bell, Ph.D., professor of zoology, Albright College, Pa.

Roger H. Bowman, Ph.D., endocrinologist and professor of physiology, Bucknell University.

Andrew C. Rice, Ph.D., food bacteriologist. Assistant professor on food science, University of Wisconsin.

Melvin J. Fregly, Ph.D., expert in high atmosphere physiology and instructor in physiology, Harvard.

David Orville Karraker, ornithologist. Assistant naturalist, Everglades National Park.

Lydia Tiemann, President

ALPHA KAPPA

—Hunter College
695 Park Ave.
New York 21, N. Y.

President: Joan Weinberg Weiss
Vice-Pres.: Prof. T. Salmon
Cor. Sec.-Rec. Sec.: Prof. V. Koehring
Treas.: Bernice Goldberg
Editor:
Council Rep.: Dr. Harold Clum

ALPHA LAMBDA

—University of Utah
Salt Lake City, Utah

President: John C. Frandsen, 203 Biology Bldg., Univ. of Utah
Vice-Pres.: Roy Speirs, 203 Biology Bldg., Univ. of Utah
Sec.-Treas.: Donald B. McDonald, 203 Biology Bldg., Univ. of Utah
Editor: Jon B. Ghiselin, 203 Biology Bldg., Univ. of Utah
Faculty Co-Advisors: William H. Behle, 1233 East 8th Ave.; George F. Edmunds, 762 Yale Ave.

ALPHA MU

—Oregon State College
Corvallis, Oregon

President: Denzel Ferguson, Natural History Bldg.
Vice-Pres.: Ted C. Dyrness, Soils Dept.
Cor. Sec.: Felicia Wirtz (Mrs.), Botany Dept.
Rec. Sec.: Samuel J. Dunn, Farm Crops Dept.
Treas.: Jack Foster, Zoology Dept.

Editor: Robert Hughes, Food Technology Dept.

Council Rep.: Dr. Ivan Pratt, Zoology Dept.

Honorary Member:

Dr. Henry P. Hanson, Dean of the Graduate School at Oregon State College.

The Alpha Mu chapter of Phi Sigma had its earliest beginnings in 1920 as Samara, an honor society for advanced women students in botany on the University of Oregon campus at Eugene. In 1929 the members of this Society became interested in Phi Sigma, and at the suggestion of Dr. Ortenburger, officially disbanded Samara and organized Beta Lambda in order to enlarge the scope of their organization. The latter group included in its membership both men and women of high standing from all biological departments. Since the specific purpose of the organization was affiliation with Phi Sigma, the constitution was patterned after that national organization.

In the spring of 1932 the state system of higher education in Oregon was reorganized. The School of Science was established with upper division and graduate work at the State College at Corvallis and lower division work at the University and the Normal Schools. At this time Beta Lambda became The Beta Lambda Society of the School of Science of the Oregon State System of Higher Education with headquarters at the State College and active members at the University of Oregon and at the University Medical School at Portland.

The petition for a charter was submitted to the National Council of Phi Sigma in January, 1933. Alpha Mu chapter was installed Nov. 18, 1933, with M. Elaine Williams as first president; Noal Larson, vice-president; James Roaf, secretary and Rich Warrington as treasurer.

The Alpha Mu chapter now numbers about 85 active members. Our lecture program for 1955-56 was un-

der way on Oct. 25 with Dr. Wilson H. Foote, associate professor of farm crops, whose topic was "Experiences in Agricultural Research and Graduate Study in Sweden." He was followed on Nov. 29 by Dr. Virgil Freed, associate chemist, agricultural chemistry, who spoke on "Selective Toxicity as a Biological Phenomenon." On Jan. 24, Dr. H. B. Cheney, head of the Dept. of Soils, discussed "Soils and Their Management in the Pacific Northwest."

Our future speakers will include: Dr. Wayne V. Burt, assistant professor of Oceanography, on Feb. 21, who will relate his experiences on "The University of California East Tropic Expedition."

Dr. James Kezer of the University of Oregon, as our annual banquet speaker (March 8), whose topic will be "The Plethodontid Salamanders and Their Chromosomes." At this meeting our new members will be introduced and brought into the chapter.

For April we are planning to invite an "off-campus" speaker and in May we will have the annual Phi Sigma picnic.

ALPHA NU

—University of New Mexico
Albuquerque, New Mexico

President: John DaVanzo, Dept. of Biology, Univ. of N. M.

Vice-Pres.: Edith Bratton, Dept. of Biology, Univ. of N. M.

Cor. Sec.: Laura Coburn, Dept. of Biology, Univ. of N. M.

Rec. Sec.: Emma Romero, Dept. of Biology, Univ. of N. M.

Treas.: Barry Pullen, Dept. of Biology, Univ. of N. M.

Council Rep.: Dean Edwoard F. Cas-tetter, Dept. of Biology, Univ. of N. M.

Former Members:

Garth H. Blakely, M.D.; Ann W. De Huff, M.D.; Mrs. Mildred T. Faris, professor of social work, University of Oklahoma; Lee F. Ferrell,

M.D.; Horace Tillman Gardner, M.D.; Norman Pine Lincoln, M.D.; Marvin D. Rohovec, principal, Clayton High School.

Frank C. Hibben, professor of anthropology, University of New Mexico; Bright E. Greiner, principal, Taos High School; Tom I. Downing, M.D.; W. B. Castetter, professor of Ed. Admin., University of Pennsylvania; Alvin R. Grove, prof. of botany, Pennsylvania State University.

Theodore Norris, professor of biology, American University; James Spuhler, professor of anthropology, University of Michigan; Oscar Syme, M.D.; Robert D. Spensley, M.D.

George William Prothro, M.D.; David Dills Stevens, M.D.; Earl D. Camp, professor of biology, Texas Tech; Lora Shields Mangum, professor of biology, Highlands University.

Carrie Ann Elkin, professor of biology, Hofstra College; Arnold Feil, M.D.; Frank McMains, M.D.; Ronald Dorn, M.D.; Charles Metzler, M.D.; Gilbert Gutierrez, M.D.; Roger Wotkins, M.D.; Scott Adler, M.D.; James R. Brown, M.D.; Robert G. England, M.D.; Robert Stubbs, M.D.

George A. Atkinson, M.D.; Leon J. Butterfield, M.D.; Owen F. Kline, Jr., M.D.; Willis W. Pickel, M.D.; John Roberts, M.D.; Robert Elia, F. A. Giere, professor of biology, Luther College; Dr. F. G. Hirsch, Loveland Foundation; Robert G. Norfleet, M.D.; Ernest Rosenbaum, M.D.; Wilfred Stedman, M.D.; John Wiley, M.D.

Dr. E. F. Castetter, who is now head of the Biology Dept. at the University of New Mexico and who has helped raise the Department to its present status, was dominant in the founding of the Alpha Nu chapter of Phi Sigma. Dr. Castetter was aided by Dr. Fred H. Allen, who was at that time a member of Phi Sigma.

There was, at first, an honorary society called Cacique at the University. This name has reference to the Indian spiritual leader in a pueblo.

Phi Sigma was petitioned by the University organization and was accepted by the chapters of Phi Sigma. The Alpha Nu chapter was installed on April 21, 1935, by A. I. Ortenburger, who gave the address.

The 12th general meeting of Phi Sigma was held on the campus of UNM at Albuquerque, N. M., from the 28th to the 30th of December, 1948. Dr. E. F. Castetter, who was chairman of the Biology Dept. at that time, was also one of the 1948 Convention officials.

On Dec. 28, 1948, several papers were presented by UNM students. Dr. Arthur Ortenburger was chancellor of the Phi Sigma Society and Dr. R. B. Goldschmidt gave the presidential address. This address, "Research and Politics," was considered so important that it was published not only in *The Biologist* but also in *Science* magazine.

Alpha Nu chapter of Phi Sigma holds its monthly meetings usually on the first Thursday of the month. After each meeting a lecture is given on some interesting phase in biology. This year we have had three very interesting lectures, two of them given by our new faculty members, Dr. J. S. Findley and Dr. R. C. Jackson. Dr. Findley spoke on "Recent Concepts in Vertebrate Speciation" and Dr. Jackson spoke on "Natural Hybridization of Perennial Sunflowers." The other lecture was given by Dr. Ulrich Luft who spoke on "Acclimatization to High Altitudes." Refreshments are served after the lectures.

We hold two initiations, one in the fall and one in the spring. A banquet is held after the initiation ceremony followed by a lecture given by an outstanding lecturer.

On Dec. 6 Alpha Nu elected to membership: Landon Emanuel Bowers (faculty), Ray Floyd Brandenburg, Richard William Dickenson Bryan, Elbert Lauson Clemmer, Patrick Alan DeLong, Robert James Dierman, Richard Martin Granberg, Richard Augustin Heise, Otis Ben Hodges, Raymond

Carl Jackson (faculty), Robert Alfred McPherson, Carolyn M. Nielsen, Janis Ann Reeves, Jerry Hugh Rigler, Barry Pullen, Treasurer

new members, two are graduate students and the remainder are undergraduates.

Sam A. Margolis,
Editor (Pro-Tem.)

ALPHA XI

—University of Rhode Island
Kingston, Rhode Island

President: Hytho Haseotes
Vice-Pres.: John L. Partyka, Jr.
Cor. Sec.: Raymond J. Roberge
Rec. Sec.: Veronica D. Wujcik
Treas.: George L. Brown
Editor: Ellsworth C. Maine
Advisor: Prof. Robert A. DeWolfe

Our present activities have been limited by our size. Aside from our regular meetings we have jointly sponsored with the Dept. of Biology several of the scientific colloquia presented in the University. In the future we intend to publish at least one edition of *The Cell*, the University of Rhode Island Phi Sigma publication. We also are sending several representatives to the New England Biological Conference, two delegates and several people who will present papers. Within the next few weeks we will move into our new quarters and we are eagerly looking forward to furnishing this room so that we will have a central meeting place for the University of Rhode Island Phi Sigma Society members.

During the past year the Alpha Xi chapter has concentrated on the process of reactivation. In connection with this we have elected the following new members to the Society:

First semester: George L. Brown, Thomas F. Geary, Sam A. Margolis, Mrs. Mary E. Rehwaltdt, Raymond J. Roberge, Frank A. Serra, Joseph Wells, Miss Veronica D. Wujcik.

Second semester: Eugene F. Edwards, Richard J. Hull, Frederick O. Lanphear, Ellsworth C. Maine, John Magliocco, Jr., Leo W. Minisce, William F. Munk, John L. Partyka, Jr., Robert S. Stewart, Jr. Of the 17

ALPHA OMICRON

—Marquette University
Milwaukee, Wisconsin

President: Robert Korn, Biology Dept., Marquette Univ.
Vice-Pres.: Edward Frank, Biology Dept., Marquette Univ.
Cor. Sec.: Vitrude DeSpain, Biology Dept., Marquette Univ.
Rec. Sec.: Margaret Tessaro, Biology Dept., Marquette Univ.
Treas.: Ray Snyder, Biology Dept., Marquette Univ.
Editor: Patricia Wroblowski, Biology Dept., Marquette Univ.
Faculty Advisor: Dr. James Barrett, Biology Dept., Marquette Univ.

ALPHA PI

—University of Colorado
Boulder, Colorado

President: Robert P. Higgins, 2404 Water C. Boulder, Colo.
Vice-Pres.: Deborah Ann Merrill, 1025 15th, Boulder, Colo.
Sec.: Alvin M. Earle, 990 14th, Boulder, Colo.
Treas.: Oakleigh Thorne II, 1201 Balsom, Boulder, Colo.
Editor: Kathryn Obergfell
Council Rep.: Dr. Charles H. Norris, Assoc. Prof. Biol., Dept. of Biology, University of Colorado

ALPHA RHO

—University of Arkansas
Fayetteville, Arkansas

Council Rep.: Dr. Delbert Swartz, Dept. of Bacteriology, University of Arkansas

ALPHA UPSILON

—University of California at

Los Angeles
Los Angeles 24, California

Council Rep.: Dr. Bernard O. Phinney, Dept. of Botany

ALPHA PHI

—College of Puget Sound
Tacoma, Washington

President: Mrs. Charles B. Arnold,
1224 North Tacoma Ave., Tacoma, Wash.

Vice-Pres.: Charles B. Arnold, Jr.,
1402 North Oakes, Tacoma, Wash.

Cor. Sec.: Ruth J. Brown, 3805 7th St., Tacoma, Wash.

Rec. Sec.: Virginia Weeks, 314 South K St., Tacoma, Wash.

Treas.: Walter Roth, Remann Hall, Tacoma, Wash.

Council Rep.: Dr. Gordon D. Alcorn, College of Puget Sound

Alpha Phi chapter was established in February of 1948 with a list of 22 charter members. Charter members Jerry Baker, Jeanne Boucher, Glenn Brokaw, Rodney Brown, Murray Johnson, Merle Legg, are all practicing physicians. Two members (Dr. Alcorn and Dr. Robert Sprenger) are on the College of Puget Sound faculty. E. Ford Dicks is regional forecaster for the U. S. Weather Bureau at Olympia. Norman Hawkins is a practicing psychiatrist in a Seattle hospital. Frank Jones and Obert Soyde are teaching biology in local high schools. Retired ornithologist Edward A. Kitchin is now living in Port Angeles. Herman Myhrman has recently retired as Director of Audio-visual Education in Tacoma public schools. Dr. James R. Slater is now Emeritus Professor of Biology at C.P.S.

Some of our graduates since our founding are located and are doing the following vocations:

George Fairfax, Robert Johnson, James Caillouette, Frederick Anson, Roger Grummel, Robert Martin, Maurice Snyder, Malcolm Snyder, John Chapman, Oivind Gundersen, Virgil Comstock, Lila Pasnick, Donald

Poage, Joseph Snyder, are practicing physicians in the Northwest. Weldon Rau is paleontologist for the Standard Oil Company. Irene Cresco is professor of biology at Pacific Lutheran College. Howard Irwin is completing four years as a Fulbright teacher at Queens College, Georgetown, British Guiana. Doris Stewart is professor of physiology and anatomy at Montana State.

Jack Cowan is completing his Ph.D. at Washington State College. Lon and Larry Hoover are graduating this June from Chicago College of Osteopathy. Walter Roth is director of education for Remann Hall, Tacoma. Al Hennefer teaches science in the Tacoma city schools. Charles Kruger is studying for the degree of Dr. of Vet. Medicine at Washington State College. Delores Jordahl teaches biology in the Clover Park schools. Norman Anderson has a leave of absence from CPS to complete his Ph.D. in paleontology at the University of Utah.

Alpha Phi chapter has been unusually active in the past two years. With the striking growth of the Museum of Natural History, there has been renewed interest in the out-of-doors. The years 1954-55 emphasized fish and the fisheries problems in the Northwest. There were visits to outdoor projects and hatcheries during the salmon runs. The speaker at the annual banquet was Dr. Ernest Salo, Fisheries Biologist, State Department of Fisheries. There are plans to continue with this phase of biology with some ornithology and mammalogy added this year. During the last three or four years, Alpha Phi chapter has met regularly once a year with the Pacific Northwest Bird and Mammal Society at an evening meeting. Our chapter is never large but always has been very active with meetings averaging about six in number per academic year.

New members for 1955-56 are: Don Acheson, Bob Anderson, Dr. Charles Arnold, Sr., William Baird, Don Dudley, Virginia Luckey, Juris

Mac's, Ralph Whiting, David Wilhyde and Bryan Williams.

ALPHA CHI

—University of the Philippines
Quezon City, Philippines

President: Mrs. Paz Angeles-Puruganan, 34 Mayong St., Quezon City

Vice-Pres.: Dr. Virgilio C. Esguerra, College of Veterinary Medicine, U. P., Quezon City

Cor. Sec.: Dr. Pedro U. Dumag, College of Veterinary Medicine, U.P., Quezon City

Rec. Sec.: Eliezer P. Pastor, Dept. of Zoology, L.A., U.P., Quezon City

Treas.: Miss Remedios G. Ona, College of Pharmacy, U.P., Quezon City

Editor: Mr. Zenon R. Torres, Lab. Dept., College of Liberal Arts, University of the East, Manila

Council Rep.: Dr. Gregorio T. Valesquez, Dept. of Botany, Liberal Arts, U.P., Quezon City

Advisers: Dr. Gregorio T. Valesquez, Dr. Amado T. Feliciano, Dept. of Zoology, Liberal Arts, U.P., Quezon City

Honorary Members:

Dr. Angel S. Arguelles (deceased)

Dr. Liboro Gomez, College of Medicine, Far Eastern University, Manila

Dr. Zacarias de Jesus, Head, Dept. of Veterinary Parasitology and Protozoology, College of Veterinary Medicine, U.P., Quezon City

Dr. Joaquin M. Maranon, Director, Institute of Science and Technology, Manila

Dr. Juan S. Salgado, Jr., former secretary of the Dept. of Health

Dr. Marcos Tubangui (deceased)

Dr. Eduardo Quisimbing, Director, National Museum, Manila

Dr. Leopoldo B. Uichanco, Dean, College of Agriculture, U.P., College, Laguna

Dr. Patrocinio Valenzuela, Dean, College of Pharmacy, U.P., Quezon City

Dr. Deogracias V. Villadolid, former director of the Bureau of Fisheries

Dr. Zacarias de Jesus was the recipient of the honor as one of the ten top scientists of the Philippines, 1955. Drs. Joaquin M. Maranon, Eduardo Quisimbing, Leopoldo B. Uichanco, and Patrocinio Valenzuela were among the eight top scientists of the Philippines, 1954.

Among the activities of our chapter this term were:

Seminar by Dr. Eduardo Quisimbing, Director of the National Museum in the Philippines and an honorary member of our Phi Sigma chapter. Subject: "Latest Developments in the Teaching of Botany."

Seminar by Dr. Leopoldo Uichanco, Dean of the College of Agriculture, University of the Philippines, and an honorary member of our Phi Sigma chapter. Subject: "Observations on the Advances and Progress of Science Abroad." Dr. Uichanco came recently from a trip to Europe and the U. S. In the U. S. he visited leading universities and colleges and observed their science methods. He visited also his alma mater, Harvard, where he obtained his doctorate degree. In Europe he represented the Philippines at an international conference of national directors of Research Centers held at Milan.

Welcome-banquet for Dr. Joaquin Maranon, Director of our Institute of Science here in the Philippines, who has just come from atomic energy conferences there in the U. S. He gave a talk on the peaceful uses of atomic energy, after the luncheon.

Luncheon honoring our three members of the Phi Sigma, Alpha Chi chapter, who have been elected among the 10 top scientists of the Philippines. These are Dr. Francisco Fronda, Dr. Francisco Santos, and Dr. Zacarias de Jesus. Among the 10 top scientists in the Philippines, three come from Phi Sigma.

We are having our initiation for new members elected into our chap-

ter, and the induction of new officers on March 18th. For our guest of honor at the banquet we have the Secretary of Agriculture and National Resources. He was a former congressman and is an agriculture graduate. Now he is a cabinet member to the President of the Philippines.

Contributed by the Chapter President and the Editor, Mrs. Pas Angeles Puruganan and Pedro U. Dumag.

ALPHA PSI

—Virginia Polytechnic Institute
Blacksburg, Virginia

President: Edwin O. Willis, Box 6293, Va. Tech Station

Vice-Pres.: Lawrence R. Moter, Box 4864, Va. Tech Station

Sec.: G. Edwin Bunce, Biochemistry and Nutrition Dept., V. P. I.

Treas.: James W. Gill, Biology Dept., V. P. I.

Reporter: John H. Hash, Biology Dept., V. P. I.

Faculty Advisor: Dr. Maynard J. Hale, Plant Physiology

Council Rep.: Dr. Reuben W. Engel, Biochemistry and Nutrition Dept., V. P. I.

On May 24, 1949, 24 charter members of Alpha Psi chapter of Phi Sigma were initiated by Dr. Henry van der Schalie, University of Michigan, who was then National Secretary. Dr. F. S. Orcutt (now National Secretary-Treasurer), Dr. H. S. Mosby and Dr. H. B. Jackson were among the V. P. I. professors who were instrumental in the organization of this chapter.

These charter members were all members of the Biotech Society, a group which had, since 1939, been encouraging biological research at V. P. I. along the same lines as Phi Sigma. Application for membership in Phi Sigma was made by this group in 1940; however, the war delayed the merger until 1949, when the reorganized Biotech Society again applied for

membership.

Since 1949 some 232 people have been elected to membership in Alpha Psi chapter. The organization has made it a policy to elect one faculty member at each semi-annual election as well as top juniors, seniors and graduate students from curricula in the biological sciences. Present members include students in animal husbandry, dairy science, horticulture, agronomy, general agriculture, plant and animal pathology, wildlife conservation, bacteriology, biochemistry, entomology, botany and zoology.

In 1954, Alpha Psi chapter initiated an award of \$25, to be given annually, for the most outstanding undergraduate research report.

There are perhaps two men of this young chapter that merit special mention. Dr. L. G. Rich is head of the Dept. of Sanitary Engineering of Virginia Polytechnic Institute and is currently serving as counselor of the World Health Organization, Bolivia, S. A. Dr. D. A. Rosebery is head of the General Science Dept. of North East State Teachers College, Kirksville, Mo.

The Alpha Psi chapter, in an attempt to stimulate research interest among the undergraduates in the biological sciences, has been sponsoring guided tours of the V. P. I. departments engaged in the various phases of biological research. The sections visited so far include animal pathology, dairy science, entomology, agronomy, bacteriology, and biochemistry and nutrition. The tours are open to all interested persons.

Members of Alpha Psi chapter who have recently transferred to other schools: H. E. Wahlburg, Jr., University of Georgia; J. J. Ross, University of Illinois; and P. H. Smith, Washington State College.

John H. Hash, Reporter
Alpha Psi Chapter

ALPHA OMEGA

—University of Georgia
Athens, Georgia

President: Daniel Nelson, Dept. of Zoology, Univ. of Georgia
Vice-Pres.: Philip Coleman, Box 75, Campus Station, Univ. of Georgia
Sec.: Florence Rose, Zoology Dept.
Treas.: Charles Speegle, Veterinary Medicine
Editor: Edith De Zoort, Dept. of Zoology, Univ. of Georgia
Council Rep.: Dr. Elon E. Byrd, Prof. of Sool., Dept. of Zoology
Faculty Advisor: Dr. J. J. Westfall, Dept. of Botany, Univ. of Georgia

For Alpha Omega chapter, dated January 11, 1956: John Lee Anderson, James Fred Arnold, Jr., Ruth Anne Boulware, Lena Anne Bowen, Nancy Ann Creel, Robert Davis, Charles Nelson Dobbins, Jr., Robert Garfield Eagon (faculty), Sidney Alton Ewing, Marvin Lee Fleming (faculty), Erschel Harden Flowers, Ben Davis Harrington, Robert Eugene Hawkins, Claude W. Hinton (faculty), Marinel Lyon, Donald Julius McKenzie, Bayne Elmo Miller, Carolyn Nuckolls, Gayther L. Plummer (faculty), William Jackson Payne (faculty), W. Malcolm Reid (faculty), Harold Eugene Swartz, Early Maxwell Sink, Sarah Anne Staples, Al Worth Stinson, Attie A. Fleming (faculty), Lucy Alston Weeks, Arthur W. Cocca.

BETA ALPHA

—Pennsylvania State University
 University Park, Pennsylvania

President: Robert E. Chambers
Vice-Pres.: Karlee Buhman
Sec.: Eugene Waldbauer, Room 212, Frear Lab., Dept. of Zoology
Treas.: John Parsons
Editor: Howard Erickson
Council Rep.: Dr. Hubert Frings, Dept. of Zoology and Entomology

Organized first as Phi Sigma Club in early 1954, the Beta Alpha chapter became a reality and was installed on May 26, 1955 here at Penn State. Many thanks are extended to those whose guidance and efforts made this venture a success.

After experiencing the routine "growing pains", we initiated 12 new members on January 11, 1956 and are anticipating an even larger initiation this spring. Those initiated in January were: Robert Bonner, Samuel Braverman, Robert Dalzell, Joseph Jumber, William Kelton, Lowell McEwen, Donald Miller, Eileen Miller, and faculty members Mrs. L. W. Kerstetter, Dr. Leon Kneebone, Dr. Charles Rutschky and Walter Westfeld. Following the initiation, Dr. Anton J. Kovar of the Botany Dept. presented a most entertaining and well illustrated talk on "Life in the Tropics".

A joint meeting with the Alpha Iota chapter from Bucknell was held on November 3 here at Penn State. Dr. R. H. Bowman from Bucknell spoke on "Endocrine Physiology" and Dr. James E. Wright from our Botany Dept. spoke on "Salmon Genetics". This is the third time these two chapters have most successfully shared a joint program, a success we hope will continue in the future. We have annexed one of their former members, Bernice Leagus, who is now doing graduate work in bacteriology here at Penn State.

At our December program Dr. Eugene Ackerman of the Physics Dept. presented a talk on "Biophysics" in which he related the role of the biologist and the physicist in research.

We are hoping to add an international flavor to our program in April with the appearance on campus of several prominent European scientists who will be attending the first international conference to be held on biological sounds.

On 12 Jan.: Robert Bonner, Samuel Braverman, Robert Dalzell, Joseph Jumber, William Kelton, Donald Miller, Eileen Miller, George R. Bush, Paul J. Glantz, Mrs. L. W. Kerstetter, Dr. Leon R. Kneebone, Dr. Charles W. Rutschky, Walter F. Westfeld, Lowell McEwen.

Eugene Waldbauer, Secretary
 Robert Chambers, President

STOP PRESS!

- Who?** President Karl Lagler
- What?** Calls Sixteenth General Meeting
- When?** 6 - 8 September
- Where?** University of Michigan, Ann Arbor,
Michigan
- Hosts?** Beta Chapter and The University
- H.Q.?** East Conference Room, Rackham
School of Graduate Studies
- Events?** Thursday, —9:00 a.m. to 10:00 p.m.
Meetings, Luncheon, Meetings,
Banquet
- Friday, —Meetings, Field Trip, Barbecue
- Saturday, —Meetings, Adjournment by
1:00 p.m.

Subscription Blank

Detach this form and fill out order. Mail with check or money order made payable to PHI SIGMA SOCIETY.

To: DR. F. S. ORCUTT
Executive Sec.-Treas.
Phi Sigma Society
Hillcrest Drive
Blacksburg, Virginia

Date _____

I am enclosing \$_____ for my subscription to THE BIOLOGIST for the term checked below:

- | | | | |
|-------------------------------------|---------|------------------------------------|-------|
| ☐ 1 year: | \$ 1.50 | ☐ 5 years: | 6.00 |
| ☐ 2 years: | 2.75 | ☐ 10 years: | 10.00 |
| ☐ 3 years: | 4.00 | ☐ 25 years: | 15.00 |
| ☐ Life Sub.: | | 25.00 | |

Name _____

Address _____

CHAPTERS FOUNDED

- ALPHA—Ohio State University, Columbus, Ohio, 17 March 1915.
- BETA—University of Michigan, Ann Arbor, Michigan, 3 June 1916.
- GAMMA—North Dakota Agricultural College, Fargo, North Dakota, (1916).
- DELTA—University of Maine, Orono, Maine, 27 January 1917.
- EPSILON—University of Denver, Denver, Colorado, 5 March 1917.
- ZETA—University of Wisconsin, Madison, Wisconsin, 30 May 1917.
- ETA—University of Akron, Akron, Ohio, 20 April 1921.
- THETA—Michigan State College, Lansing, Michigan, 9 April 1921.
- IOTA—Washington University, St. Louis, Missouri, 28 May 1921.
- KAPPA—University of Kansas, Lawrence, Kansas, 31 May 1921.
- LAMBDA—University of Montana, Missoula, Montana, 4 May 1921.
- MU—University of California, Berkeley, California, 27 April 1922.
- NU—Washington and Jefferson College, Washington, Pennsylvania, 11 May 1922.
- XI—University of Nebraska, Lincoln, Nebraska, 3 May 1924.
- OMICRON—University of North Dakota, Grand Forks, North Dakota, 26 May 1924.
- PI—Emory University, Georgia, 3 January 1925.
- RHO—University of Illinois, Urbana, Illinois, 28 March 1925.
- SIGMA—University of Florida, Gainesville, Florida, 4 December 1925.
- TAU — Duke University, Durham, North Carolina, 4 March 1926.
- UPSILON—Miami University, Oxford, Ohio, 7 May 1926.
- PHI—University of New Hampshire, Durham, New Hampshire, 21 May 1926.
- CHI—Montana State College, Bozeman, Montana, 11 February 1927.
- PSI—University of Washington, Seattle, Washington, 7 April 1928.
- OMEGA — University of Oklahoma, Norman, Oklahoma, 24 March 1928.
- ALPHA ALPHA—University of Southern California, Los Angeles, California, 17 May 1928.
- ALPHA BETA—Mount Union College, Alliance, Ohio, 17 May 1928.
- ALPHA GAMMA—University of South Dakota, Vermillion, South Dakota, 15 May 1928.
- ALPHA DELTA—Lawrence College, Appleton, Wisconsin, 17 March 1929.
- ALPHA EPSILON — University of Pittsburgh, Pittsburgh, Pennsylvania, 23 March 1929.
- ALPHA ZETA — College of William and Mary, Williamsburg, Virginia, 19 April 1930.
- ALPHA ETA—Oklahoma Agricultural and Mining College, Stillwater, Oklahoma, 13 March 1930.
- ALPHA THETA—State College of Washington, Pullman, Washington, May 1930.
- ALPHA IOTA—Bucknell University, Lewisburg, Pennsylvania, 9 January 1932.
- ALPHA KAPPA—Hunter College, New York City, 8 January 1932.
- ALPHA LAMBDA—University of Utah, Salt Lake City, Utah, 13 February 1932.
- ALPHA MU—University and State College of Oregon, Eugene-Portland-Corvallis, Oregon, 18 November 1933.
- ALPHA NU—University of New Mexico, Albuquerque, New Mexico, 21 April 1935.
- ALPHA XI—University of Rhode Island, Kingston, Rhode Island, 17 May 1935.
- ALPHA OMICRON—Marquette University, Milwaukee, Wisconsin, 18 June 1938.
- ALPHA PI—University of Colorado, Boulder, Colorado, 24 May 1941.
- ALPHA RHO—University of Arkansas, Fayetteville, Arkansas, 23 May 1945.
- ALPHA SIGMA—University of Texas, Austin, Texas, 2 February 1946.
- ALPHA TAU—National University of Mexico, Mexico, D.F., 7 April 1947.
- ALPHA UPSILON—University of California at Los Angeles, California, 17 May 1947.
- ALPHA PHI—College of Puget Sound, Tacoma, Washington, 28 February 1948.
- ALPHA CHI—University of the Philippines, Manila, Luzon, P.I., 12 March 1949.
- ALPHA PSI—Virginia Polytechnic Institute, Blacksburg, Virginia, 24 May 1949.
- ALPHA OMEGA—University of Georgia, Athens, Georgia, 17 May 1951.
- BETA ALPHA—Pennsylvania State Univ., State College, Pennsylvania, 26 May 1955.
- BETA BETA—Florida State University, Tallahassee, Florida, 18 February 1956.

THE BIOLOGIST

THE COUNCIL

HONORARY PRESIDENT: Dr. Laurence H. Snyder, Dean of the Graduate School, University of Oklahoma, Norman, Okla.

PRESIDENT: Dr. Karl F. Lagler, Department of Fisheries, University of Michigan, Ann Arbor, Mich.

PAST PRESIDENT: Dr. Arthur I. Ortenburger, 933 Wilson St., Norman, Okla.

VICE-PRESIDENT: Dr. Samuel L. Meyer, Office of the Dean, Central College, Fayette, Mo.

SECRETARY-TREASURER: Dr. Fred S. Orcutt, Hillcrest Dr., Blacksburg, Va.

EDITOR and BOOK SUMMARIZER:

Dr. Anselm M. Keefe, St. Norbert College, West De Pere, Wisconsin

MILE POSTS

- 1915 March 17, Alpha Chapter organized, Ohio State University, Columbus.
- 1916 May, Central Governing Body organized, "Biologist" first issued.
- 1924 December, First National Meeting, Constitution revised, Washington, D. C.
- 1925 December, Second National Meeting, First Science Program, Kansas City.
- 1926 December, Third National Meeting, Second Science Program, Philadelphia.
- 1927 December, Third Science Program, Nashville.
- 1928 December, Fourth National Meeting, Coat-of-Arms adopted, Fourth Science Program, New York.
- 1930 January, Council Meeting, Ritual Revised, Norman, Okla.
December, Fifth National Meeting, Fifth Science Program, Cleveland.
- 1931 Phi Sigma Letters Registered, U. S. Patent Office.
- 1932 December, Sixth Science Program, Atlantic City.
- 1933 June, Sixth National Meeting, Seventh Science Program, Chicago.
- 1935 December, Seventh National Meeting, Eighth Science Program, St. Louis.
- 1937 December, Eighth National Meeting, Ninth Science Program, Indianapolis.
- 1939 December, Ninth National Meeting, Tenth Science Program, Silver Anniversary, Ohio State University, Columbus.
- 1941 December, Tenth National Meeting, Dallas, Texas.
- 1946 December, Eleventh National Meeting, Boston, Mass.
- 1948 December, Twelfth Meeting, Eleventh Science Program, Albuquerque, N. Mex.
- 1950 December, Thirteenth Meeting, Denver and Boulder, Colo.
- 1952 December, Fourteenth Meeting, St. Louis, Mo.
- 1954 September, Fifteenth Meeting, Gainesville, Fla.
- 1956 September, Sixteenth Meeting, Ann Arbor, Mich.

Phi Sigma is a Member of the Association of College Honor Societies, and Associate Member of both the A.A.A.S. and the A.I.B.S.